MAY, MDCCCLX.

THE ZOOLOGIST:

A

POPULAR MONTHLY MAGAZINE

OF

NATURAL HISTORY,

AND

JOURNAL FOR RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, ANNELIDES,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

Nos. CCXV. & CCXVI.

LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.

Price TWO SHILLINGS.

The Name, Paging, &c., of the 'Zoologist.'

From George Guyon, Esq.

As you solicited opinions on the proposed change in the paging and title of the 'Zoologist,' I venture to remark that having taken it in for fifteen years under that name I should regret the old familiar title; and as to the paging, I cannot conceive any alteration being required while the figures do not exceed four; it will surely be time enough to discuss that matter when the pages of the 'Zoologist' approach their tens of thousands. The introduction of Botany appears to me a much more serious affair; only a portion of your readers are acquainted with it, and to the rest a treatise on the Caffre dialects would be perhaps as acceptable; the space devoted to it would be sure to increase to the detriment of zoological matter, which is the legitimate subject of the work; but if it is decided that Botany shall share its columns, then by all means let the title be altered for the sake of consistency; I would sa "Phyto-zoologist" (fie to Zoologist).—*Ventnor, Isle of Wight, April* 4, 1860.

From A. G. More, Esq.

Let me protest, ere it is too late, against including any botanical matter i the 'Zoologist'; if at least we have prevailed upon an old friend to retain its time honoured name. However refreshing may be a taste of salad after a hearty meal o animal food, I hope few of the supporters of the 'Zoologist' are so "Darwinian" i their ideas as to consider a Cyclamen member of the Animal Kingdom. Have no zoologists already helped themselves to the sponges? and if botanists are to make stand anywhere, surely it is against the annexation of a flowering plant.

My suggestion to Mr. Newman, was that a general index to the seventeen volum already completed would be very acceptable and useful to those who are in the hab of referring to the series. For such an Index to be complete, I imagine it should be double one. The species to be given in systematic classified order, as well as alpha betically. Thus any monographer would see at once the amount of informatio bearing upon his subject. I trust the amount of trouble requisite will not b a serious obstacle to so desirable a result. Might not those who are interested in th different branches be found willing to catalogue their own department, and thus sa the publisher a part of the labour, at the same time securing greater accuracy? Th commencement of a fresh decad with 1860 seems to offer a capital occasion for th attempt; or at least for discussing the *pros* and *cons* of the plan, and the best mode setting about it.—*Bembridge, Isle of Wight, April*, 1860.

Just Published, No. 1 *of*

THE JOURNAL OF ENTOMOLOGY. Descriptive a Geographical. With Three Plates. *Price* 3*s*.

TAYLOR AND FRANCIS, Red Lion Court, Fleet Street.

To Entomologists.

MR. J. C. STEVENS begs to announce that he has received structions to dispose of by Auction, towards the middle of May, a Collection BRITISH LEPIDOPTERA, in good condition and all authentic specimens, together wit Mahogany Cabinet and a number of Store Boxes. Catalogues are preparing. King Street, Covent Garden, April 25th, 1860.

Occurrence of a Rare Bat, the Barbastelle* (Barbastellus Daubentonii) *in the Neighbourhood of London. — On the 3rd instant, when taking my first entomological walk this season in Richmond Park, I found clinging to the trunk of a large oak a bat of this rare species: it was in a state of semi-torpidity, basking in the warm sun. I think the cause of its leaving its winter quarters thus early, after so cold a season, was attributable rather to the extreme discomfort it must have suffered from the multitude of vermin with which it was infested, rather than from a very slight rise of temperature.—*Robert Mitford; Hampstead, March* 21, 1860.

Account of a Species of Phalangista, recently killed in the County of Durham.

By JOHN HOGG, M.A., F.R.S., F.L.S., &c.*

ON the 22nd of August last, a son of the rector of Redmarshall, a small village in the county of Durham, brought to me at Norton, distant four miles to the east of that place, a recently killed and singular looking animal. At first sight, the only British quadruped which it at all resembled, and that chiefly from its dark-coloured tail and yellow breast and belly, is the yellow-breasted pine martin. Of this animal I have never seen a fresh specimen—only one, a good while ago, preserved in a museum. On a very slight examination, I however found, from the two large front teeth in the lower jaw, that it could not be a species of the Mustelidæ; but it seemed (if such an animal were possible) a mule between a yellow-breasted martin and a squirrel or a rabbit; the teeth and the general aspect affording characters of some such anomalous creature. Yet, on a closer examination of its feet, and especially of its hind ones, and of its long black tail, which was evidently prehensile at its extremity, I found that it could not be any British quadruped, but some New South Wales, opossum-like, or marsupial species. Had it been a female, I should at once have detected the pouch, or marsupium, or some distinct marks of one. I need hardly add, that if I ever before had had an opportunity of examining with the least attention any species of the opossum tribe, I could not for a moment have entertained the remotest idea that it could be referred to any indigenous quadruped in Great Britain. This marsupial animal consequently could only have escaped from confinement.

The gentleman who brought it to me said it had been killed the

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* This paper (without the postscript) was read, on September 19th, to the Natural History Section, at the Meeting of the British Association at Aberdeen. Communicated by the Author.

BRITISH MUSEUM

evening before, whilst it was upon a tree on a farm near Redmarshall. The farmer, supposing that it was some savage carnivorous animal, which would destroy all the poultry in the neighbourhood, and especially, as at the time when he first noticed it, it was following some hens or chickens, he therefore, with several other men, went in pursuit of it, and at length succeeded in killing it, though not "up a gum-tree," but up a "poplar-tree," where it had made a nest with straw.

I may here add that the common opossum (*Didelphis Virginiana*) is known to attack poultry and to devour birds' eggs. So then, had the Redmarshall farmer imagined that the strange wild beast he saw to be an opossum, he would have had very good grounds for fearing the destruction of his poultry.

I will now briefly give a description of it. The length, from the tip of the nose to the base of the tail, 18¾ inches; the length of the tail about 13 inches, and the entire length 31¾ inches.

The dentition I found as follows: — Two large front teeth or incisors in the lower jaw somewhat curved inwards, and like those of rabbits and squirrels. Six incisors in the upper jaw, then two small canines — the first apart from the second, and also larger than the second; and four or five molars. The first of the molars in each jaw is somewhat compressed and of a cone shape; but the exact number of the latter I could not determine as the animal was stiff, having been so recently killed, and I did not like to force open the jaws. In the lower jaw are no canine teeth, but near the base of each of the two long incisors there appears the rudiment of a canine tooth; also the same number of molars, most likely five. If so, the dental formula of the upper jaw would be = 6 inc. + 4 can. + 10 mo. = 20 in all; and that of the lower jaw = 2 inc. + 0 can. + 10 mo. = 12 in all; and these altogether make thirty-two teeth. Legs rather short. Front foot with five long toes, and five curved, sharp and compressed claws; of these toes the two central are the longest. But the hind foot has only two large toes and two claws; and also, on the inside, a third toe, divided into two as far as the last phalanx, or at least the two are united by the skin up to that phalanx, and they have both long, sharp and compressed claws. Then beyond, again, on the inside, and placed more backward, is a large and broad thumb, though without any claw or distinct nail. The feet, of a brownish yellow, having much the character of hands, are evidently those of a climbing animal; and the same may be said of the tail, for it is prehensile, is curved inwards at the tip, and is devoid of hairs upon and under that portion.

The skin on each side of the flank, near the hind thighs, I observed to be somewhat loose and extensible, and thus, perhaps, indicating some rudiment of the loose lateral skin, which is so conspicuous in the flying opossums.

In colour, the upper portion of the body is gray, mixed with some brown and black hairs; the neck, breast, belly, and inside of the legs are yellow, with a rusty red spot and line down the breast, which extends under the forelegs. The cheeks are orange. Tail thick, black and hairy. Insides of the ears pinkish, nearly bare of hairs.

Length from the nose to the ear about 3¼ inches; and that of the ear about 2¾ inches; width of the same in the middle 1¾ inch.

This male specimen appeared to be fully grown; but as the teeth were little worn and the claws so sharp, he was evidently of no age—the general appearance of the animal being not unlike a small gray fox, though less sharp across the muzzle and with shorter legs. I found in Bewick's 'History of Quadrupeds,' (Edit. 4, 1800), p. 435, a species of marsupial from New South Wales, called the "vulpine opossum," which in dentition and description seems to agree with it. He describes it thus: —"Upper part of the body grisly, consisting of dusky, reddish and white hairs; the under parts light tawny, two-thirds of the tail black, a blackish space round each eye, and long black whiskers."

And in Cuvier's 'Règne Animal,' the same animal is, I conclude, that named "Le Phalanger Renard" (*Phalangista vulpina*). There is, however, another species of Phalangista which is likewise indigenous in New South Wales, called P. fuliginosa, or the "sooty phalangista," which, in some characters and dimensions, resembles it.

Bewick has not given a figure of the "vulpine opossum;" and I must therefore wait until I visit the British Museum and Zoological Gardens, in November, to determine with which of the two species it is to be identified; but from the descriptions that I have as yet seen, it appears to correspond best with the fox-like Phalangista, which I believe is commonly called, in New South Wales, the "brush-tailed opossum."

A bird-stuffer, at my neighbouring town of Stockton, has preserved the skin; but, as it was not finished and sufficiently dried, I could not bring it with me to exhibit to the Section.

Some of the Phalangistæ, being chiefly vegetable feeders, are eaten by the natives of Australia: I inquired of the stuffer, if the flesh was dark, but he told me it was more like that of a rabbit; I am sorry that I neglected to ask him to examine the contents of the stomach whilst he was skinning the specimen.

POSTSCRIPT.—Soon after my return home from Scotland, the owner of this animal, hearing of his capture, wrote (October 1st) to me the following particulars respecting him.

He had been brought from Australia not many months before; he had escaped from his new home in a house at Aycliffe, distant about seven miles west from the place where he was killed, after wandering for fourteen days. He was caught by a shepherd in Australia, when a very few (perhaps four) weeks old, and was considered to be about seventeen months old. The letter ends—"Your conjecture respecting the name is quite correct, as it is a specimen of the brush-tailed opossum."

Having lately visited the British Museum, I found that the Phalangista vulpina, of which there are many stuffed specimens in the Mammalia Saloon, is a slighter, more elegant and delicate animal, with smaller limbs and a finer fur; and in its head more like a small fox, though much of the same colour as mine, and that the Case 55 contains two or three gray examples of the Phalangista fuliginosa, which much more resemble my specimen. I have therefore no doubt that this animal is a young male of the sooty phalangista in its second year of coating, and before it had attained to its specific dark, or brown-black colour. The fur is rougher and coarser, and the animal is stouter and larger in some of its dimensions, and is altogether less interesting than P. vulpina.

I have also just seen three living specimens in the Zoological Gardens of the fox-like and one of the sooty phalangista — this last in his black fur, and they quite confirm my opinion. They appeared gentle and quiet creatures, and were feeding on cabbage, carrots and soaked bread; they gnawed off largish pieces of these substances, and, holding them in their fore-feet, were leisurely eating them after the manner of squirrels. They had good beds of straw in their cages, and the keeper told me they must be kept warm in the winter.

Mr. Waterhouse, in his 'Natural History of Mammalia,' vol. i., p. 291, gives the length of P. fuliginosa, as 22 inches from the nose to the base of the tail, and of the tail 14 inches = 36 inches in all; and of another, as 18 inches 6 lines, and 12 inches, or 30 inches 6 lines altogether; and this last, he says, was a light gray, and entirely corresponded in colour with P. vulpina. He further mentions other individuals as being intermediate in their colouring between the sooty and the gray specimens. It is consequently evident that the P. fuliginosa is a very variable species, much influenced by age, and perhaps by food and temperature. Indeed, Mr. Waterhouse (p. 293) believes that P. vulpina and P. fuliginosa are specifically identical; although I understand Mr. Gould considers them as distinct.

One of the earliest descriptions of the former animal, written by the celebrated John Hunter, is in the Appendix to White's 'Journal of a Voyage to New South Wales,' p. 278 (Lond. 1790), where the native name of "Wha Tapoau Roo" is given, and it is accompanied with a neatly coloured etching; but the figure intended for the same species, p. 150 in 'Phillip's Voyage to Botany Bay,' published the year before, is extremely bad.

Remarks on the Winter Visits to the British Isles of European Summer Migrants. By John R. Kinahan, F.L.S., M.R.I.A.*

The migration of birds has been from earliest times an object of attention and admiration even to the unscientific. I need not more than allude to the frequent references to, and accurate descriptions of it, which occur in the oldest classics; and even among unlettered savages at the present day we find the migrations of birds anxiously watched for, and in some cases accurately predicted. It is therefore no matter of surprise that scientific men should have long ago made its phenomena a subject of study, and have traced many of its laws. There are, however, certain anomalies in distribution, in reference to the occurrence, at irregular intervals, of species which, in closely adjoining countries, are migratory. These, it appears, have not attracted as much attention as they deserve, and are connected with migration. Of these the most remarkable is that to which the title of this paper refers, viz., the occurrence of summer migrants in winter. Before entering on this subject, however, it will be necessary to lay down briefly what is here understood by migration in birds. In a former communication (Proc. Dubl. Nat. Hist. Soc. vol. ii. p. 91), when treating on the distribution of ferns in Ireland, three general laws were enunciated as governing the distribution of organized species. These were: — That all species require a certain fixed *standard* amount of the great physical agents for their *due* development; that this standard may be altered within certain limits without destruction to the species, though at the expense of its well-being (*range of existence*); and lastly, that there are certain fixed limits to this range outside of which the species must absolutely perish. Now, remembering that the standard of existence is not necessarily uniform in different species, nor even at different ages of the same species (the standard of existence in the adult bird having a more extensive range than in the young), and bearing in mind that the food of the two differs greatly in quantity, *periodic migrations* that is, those strongly-marked passages, at fixed periods of the year, of species from one area to another, are easily explained, excluding at present those migrations in which the passage performed is merely a shifting from one district to another similar one, necessitated by the failure of food.

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* Read before the Natural History Society of Dublin, January 13, 1860. Communicated by the author.

Taking such a view of the case, migration resolves itself into this: a species (the whitefronted goose, *Anser albifrons*, for instance) rears its young in the North during the summer season of that region, when food of the kind suitable for those young is easily procurable; after the young are fully developed winter sets in, and either destroys that food or renders it unattainable or nearly so. The species, flying the winter, travels south; finding in its course conditions pretty similar to those which prevailed in its summer abode in more northern latitudes: when at length it has reached a district (suppose Great Britain) in which these conditions, or at least conditions compatible with its adult existence are permanent in the winter, it there abides until the increasing heat of the spring renders its adopted home unsuited to it, or, at least, to its future progeny. Again it takes up its journey, travels north, flying from the summer heat; such a species arriving here in the winter the Briton calls a winter migrant. A second species (the house swallow, *Hirundo rustica*) rears its young in Britain; this duty over, on the appearance of the British winter, it seeks in the milder latitudes of the South its winter quarters, returning again to the North when these prove too hot to hold it; and such a species the Briton calls a summer migrant.

This explanation is not contradicted by the occasional breeding and residence, through the entire year, of individuals in districts intermediate between the actual northern and southern hiemal and æstival residences of the species, because it must be remembered that *the limits of the standard of existence* of a species are sometimes very extended, occasionally almost equally so with the limits of the *range* of its existence; also that the climate of every part of the districts passed through in migration are not either uniform nor uniformly constant in each year, and hence that it may occur that a bird in its northerly progress, from some cause or other late in its migration,—as for instance, a weakling left behind at the annual starting point, whence all the stronger birds pushed boldly forwards for the North,—may, on finding the instinct of nidification too strong upon it, build its nest in the first spot which copies its proper summer region sufficiently near to fall within the extreme limits of its standard of existence, or even in a district which, whilst falling within the range of its existence, is yet excluded from this standard.

That summer and winter migrations take place almost always, if not always in a line due north and south, is an argument in favour of this explanation. I cannot call to mind a case in which nidificatory migration is markedly east and west over an extended area. In some few cases, it is true, the line of migration is not bounded by strictly parallel longitudinal lines east and west, but this might have been premised, since neither can areas similar in their climates be bounded by parallel lines, but in tracing such, northwards or southwards, we meet with divergent outlying sub-areas which copy the climates northward or southward of them rather than those adjacent to them in a direct line. Such exceptions are, however, rarer than might have been expected.

A few instances selected from among the birds of the British Isles (as these have been best studied) and of these choosing species, which occurring north in Great Britain, might have been expected to occur in Ireland also, but do not, will suffice to illustrate this.

Nightingale (*Sylvia luscinia*) occurs in Cumberland (Carlisle) Lancashire, Yorkshire, Lincolnshire, Norfolk, Suffolk, Essex, Middlesex, Kent, Somerset, Hants, Sussex, and East Devon. It is common only in the easternmost of these shores, being rare in Cumberland, Lancashire, Somerset and East Devon, unknown in West Devon and Cornwall; apparently so in Scotland, certainly in Wales. North of Britain it occurs in Sweden, Russia and Siberia; and south, in the eastern parts of France, Germany and Spain, wintering in North Africa, Egypt and Syria; unknown in the Channel Islands and Brittany. Now, if these points be connected on the map, it will be be seen that the regular line of migration is to the eastwards of a line which cuts off Ireland, Wales, Scotland and part of England.

Red-backed Shrike (*Lanius collaris*) occurs in Cumberland, Wales and the South of England, not in Scotland. North; in Russia, Sweden, Denmark. South; in Germany, France, Spain, North Africa and Cape of Good Hope. Its line of migration being slightly to the westward of the nightingale, but still excluding Ireland.

Pied Flycatcher (*Muscicapa atricapilla*), in the like manner, whilst extending as far North as Scandinavia and Central Russia, is rare in the south-western shires and unknown in the north-western.

Lesser Whitethroat (*Sylvia curruca*) extends into Wales, but is rare there, showing that this is an outlying station. It is unnecessary to multiply examples further, for the same laws will be found to be more or less strictly applicable to all the regular summer migrants of Great Britain unknown as such in Ireland.

Now, it has been already shown that in the districts lying east and west of the area included within the normal migratory lines of each species, there occur subareas which are nearly as suitable for the well-being of such species as the districts contained within these limits; and hence, if by any disturbing cause a migratory bird is driven out of its usual course, it may in such subareas find a spot in which it can subsist, and where it will probably remain until more favoring circumstances enable it to regain its course, and if this divergence takes place during its northernly migration it may possibly breed here.

Remarkable instances of these latter phenomena are seen in Ireland among southern migrants; in the golden oriole (*Oriolus garrula*), blackcap warbler (*Sylvia atricapilla*), hawfinch (*Fringilla coccothraustes*), crossbill (*Loxia curvirostris*), rose pastor (*Pastor roseus*), hoopoe (*Upupa epops*), melodious willow wren (*Sylvia trochilus*), stone curlew (*Œdicnemus crepitans*), dotterell (*Charadrius morinellus*), and possibly in the grasshopper warbler (*Sylvia locustella*); and in Great Britain, in the golden oriole, hoopoe and rose pastor, &c.

Taken it as proven, that migration takes place in a line north and south, that it has fixed longitudinal limits, and that through disturbing causes species occasionally transgress these limits and survive, the occurrence of summer European migrants in these isles is what might have been expected,— all that has occurred is this, — the birds in their passage south meeting with easterly gales have been driven from their course, and, finding here localities suited to their habits, remain either till spring or till a favorable moment for continuing their southern journey arises.

The instances of the occurrence of such birds in Ireland in winter are more numerous than might be supposed from published records. I have collected all I could come across, either from my own researches, from those of R. J. Montgomery, Esq., jun., of Ballina, kindly communicated to me by that gentleman and from Thompson's 'Fauna of Ireland,' and have little doubt that they do not represent a tithe of the instances in which this has occurred. We may divide them into — 1st, regular British summer migrants, unknown as such in Ireland, though one or two have occurred during this season here; 2nd, Irish summer migrants; and 3rd, European summer migrants, only irregular visitants to the Britannic area.

1st. British summer migrants :—

Reed Wren (*Sylvia arundinacea*). Dublin, December, 1843.

Redstart (*Sylvia phœnicurus*). Dublin, 1828 and 1830; Queen's Co., 1847; Belfast.

Blackcap (*Sylvia atricapilla*). Belfast, 1834; Dublin, 1833, 1843, 1846, 1847. This bird occurred in Phœnix Park in the summer of 1844, and has bred in the county of Dublin and elsewhere many times; Tipperary, 1834; Waterford, 1830, 1834 and 1858; Galway, 1842; Cork, 1839. This species is recorded as having occurred in England several times in winter.

Stone Curlew (*Œdicnemus crepitans*). Dublin, 1829 and 1849; Waterford, 1840; Kerry, August, 1842; Wexford, 1844.

Dotterell (*Charadrius morinellus*), breeds in Ireland rarely. Down, 1834; Tipperary, 1853.

Spotted Crake (*Gallinula porzana*). Occasional in summer. Belfast, 1835, 1847 and 1848; Donegal and Down, 1828 and 1848; Dublin, 1835; Wicklow, 1835; Queen's Co., 1834; Kerry, 1845 and 1846; Clare, 1832; Waterford, 1842 and 1843.

Ruff (*Machetes pugnax*). Nearly regularly every winter. Antrim; Donegal, 1837 and 1838; occasionally in Dublin; Wicklow, 1853; Kildare, 1838 and 1840; Tipperary, 1848.

2nd. Irish summer migrants :—

Ring Ouzel (*Turdus torquatus*). Dublin, 1842 or 1843, 1847 and 1848.

Whinchat (*Sylvia rubetra*). Dublin, 1847, 1848, 1850 and 1859.

Sedge Warbler (*Sylvia Phragmites*). Dublin, 1842.

Whitethroat (*Sylvia cinerea*). Dublin, 1843.

Chiffchaff (*Sylvia rufa*). Louth, 1849; Castle Warren, Co. Cork, November, 1850 to February, 1851.

Common Swallow (*Hirundo rustica*). Louth, December, 1850; Castle Warren, Co. Cork, 1849. It is a question whether the birds of this species and the sand martins (*Hirundo riparia*), seen sometimes late into the autumn and winter, do not fall under this category rather than under that of birds which have overstaid their time here. I have seen the former species about Dublin late in November in several years (the past one among the number), and have always remarked that when this occurred there was an interval during which no swallows at all were visible, and then the species reappeared. G. H. Kinahan, Esq., sends me a note of the occurrence of the sand martin at Castle Connell, Co. Limerick, November 30th, 1859.

3rd. European summer migrants, occurring in winter in the Britannic area:—

Great Gray Shrike (*Lanius excubitor*). Northumberland and Cumberland, Durham, Cheshire, Worcester, Norfolk, Cambridgeshire, Suffolk, Hertford, Surrey, Kent, Sussex and Devon. On two occasions it has bred in England. The species is noted in Norway, Sweden, Denmark, Lapland and Russia. South; in Germany, Holland (rare), France, Spain and Fezzan. In Ireland the species has occurred in Antrim, 1834 and 1835; Down, 1845; Londonderry, 1846; Sligo, 1831 or 1832; Westmeath and Dublin, 1822 or 1823, 1831 and 1850; Queen's Co., 1847; Tipperary, Waterford and Cork, 1824, 1844 and 1845.

Black Redstart (*Sylvia tithys*). Kirkwall, Orkney ('Field' newspaper, 1860); Derby, 1856; Norfolk, 1849; Oxford, 1852; Gloucester, 1830 and 1835; Middlesex, 1829; Hants, 1842, 1849 and 1852; Sussex, 1830, 1839, 1843, 1849, 1850, 1851, 1852 and 1853; Devon, 1833, 1843, 1847, 1849 and 1850; Kent and Cornwall, 1842, 1843, 1844, 1849, 1853 and 1856. Mr. Edward Hearle Rodd states it is a regular winter visitant to Cornwall. Its range is Sweden (scarce), Germany, France and Holland (rare), Spain (a winter visitant), Provence and Italy (where it resides in winter), Cape Sicily, Malta and Tangier; it is also recorded from the Morea and Smyrna; and Assistant-Surgeon, William Carte, has brought it from the Crimea. In Ireland the species has occurred in Antrim, 1841; Dublin, 1859; Wexford, 1836; Waterford, 1828, 1829 and 1843; Cork, 1845. The parallelism between these species as to distribution and occurrence is striking, and the necessary connection between the causes of it scarcely needs comment.

These remarks have already run to such a length, that I must omit the many examples which might be quoted from the other groups of birds falling under the same categories, for these have sufficiently proven that the explanation given is correct. Confirmation of the same thing is also seen if examination be made into other facts relating to distribution; for instance, we find that of the group of birds which are resident in Great Britain, non-resident, yet occasional visitants to Ireland, all are migratory in some parts of the European continent and have occurred in Ireland in the winter; as examples may be cited, — the kite (*Falco milvus*) and the great spotted woodpecker (*Picus major*), Antrim, 1839 and 1849; Londonderry, 1802; Armagh, 1845; Dublin, 1831 and 1850; Carlow, 1845; Tipperary, 1831 and 1849; Sligo, 1835 and 1850; in two cases only have these birds occurred here (viz., May and August) in other than the winter months. It is remarkable also that all the southern species which have only occurred once or twice in this country have done so in winter, — the spotted eagle (*Falco nævius*), griffon vulture (*Vultur fulvus*), White's thrush (*Turdus Whitei*), crested lark (*Alauda cristata*), two-barred crossbill (*Loxia bifasciata*), &c. Northern stragglers occurring here, as the eagle owl (*Strix bubo*), snowy owl (*Strix nyctea*) and Bohemian waxwing (*Bombycilla garrula*), have been long ago recognized as birds driven from their migratory course, and an error has been committed in not making a more general application of the same law in all cases of accidental visitants,— an error the more surprising as some of our authorities, as for instance William Thompson have recognized that such is the case in regard to many species, as the woodpecker, quoted above.

I have little doubt that to the same principles we must look for the explanation of the fact, that the occurrence of Australian, American and African birds, such as the great spotted cuckoo (*Cuculus glandarius*), yellowbilled cuckoo (*Cuculus americanus*), belted kingfisher (*Alcedo alcyon*), Egyptian goose (*Anser ægyptiacus*), and soft-billed duck (*Anas membranaceus*), have mostly occurred in the winter.

I must apologize for the length to which these remarks have run, but that they were called for is sufficiently shown by the constant remarks of wonderment met with in authors, as to the absence, in Irish and Scotch lists, of species met with in England and also occurring much further north. I hope to return to the subject at some future time, and will now conclude by calling attention to the fact that, by examination of the few dates given, it will be seen that these accidental occurrences of species have occurred nearly in the same years, showing that the same causes have caused divergence from the usual routes in almost every case.

John Robert Kinhahan.

A List of the Birds of Banffshire, accompanied with Anecdotes.

By Thomas Edward.

(Concluded from page 6849.)

Curlew Sandpiper (*Tringa subarquata*). I have only met with one specimen of which I can speak with certainty; this was in September, 1852.

Knot (*T. canutus*). A few generally visit us every autumn on their southward passage. They are remarkably easy of approach.

Little Stint (*T. minuta*). A very fine little fellow. I once had a desperate hunt after one. Returning home one evening along our links, I heard a strange cry, coming, as it seemed, from the shore. I listened for some time, as I knew it was the season (September) for many of our migratory species visiting us. Never having heard the cry before, I was speedily on the beach. But it was dark, and I had not cat's eyes; the sound, too, ceased as soon as I gained the beach. After groping about for some time I thought I espied a rather large flock of birds at some distance along the shore. I approached cautiously, and found that I was correct, the flock consisting chiefly of ringed plovers, dunlins and sanderlings. From the latter circumstance, and from the fact that the cry was that of a sandpiper, I was pretty sure that a stranger was amongst them. Although I could see well enough that the birds were on the wet sand between me and the water, I could not make them all out distinctly. Once or twice I thought I could distinguish one considerably smaller than the others, but directly felt that I had been mistaken. I was now in a state of great excitement; every limb shook like an aspen leaf, or a cock's tail on a windy day. What was I to do? True I might have fired at them, but the odds were greatly against my being successful. It was now fairly dark, and the birds had retired to rest on a ridge of shingle which intervenes between the sands and links. Instead of returning home, as any one else would have done, I laid in a hollow till morning, to await their first appearance, in the hope of attaining my object.* It proved a wet and windy night, but daylight brought with it a fine morning; with it also came two gunners along the beach. This vexed me to the very heart. The birds were not yet astir, but I knew they would rise at the approach of the men, who would doubtless attempt to shoot them. Just as I anticipated, up went the birds, crack, crack went the shots, and down fell several birds. Rising from my stony couch, I rushed at once to the spot to see the victims, and found them all to consist of sanderlings, dunlins and one ringed plover. The gunners were strangers to me, but I ventured to ask them to abstain from firing until I had satisfied myself about the bird I sought; but they seemed unable to understand why one bird could be of so much more interest than another, and told me that, as there were plenty of them, I could fire away, and take my chance. I declined to shoot with them, but eagerly watched each time they fired, and if a bird fell I went and examined it, but did not meet with the one I sought. They at last got tired, and went away. It was now my turn; but unhappily the birds, from being so often fired at, had become extremely shy, so that to near them sufficiently for my purpose was all but impossible. By perseverance, however, I at length again made out one, as I thought, a good deal smaller than the others. I succeeded in creeping a little nearer. They rose, I fired, and down fell four. I rushed, breathless, hoping to pick up the bird in which I took such interest. But alas! no: it was not there. And away went the remainder towards the sea; then, turning, they rounded a point or headland called Blackpots, and disappeared from view. From this and their not returning I knew that they had gone to the sands at Whitehills, about three miles distant, to which place I proceeded; but no sooner was I there than back they flew in the direction they had come. Back I went also, and found them at the old place. Just as I reached them away they went once more, and of course away I went likewise. In this way we continued nearly the whole day, they flying to and fro, I following them. Towards evening, my strength beginning to fail, and feeling quite exhausted, I gave up the chase, and once more took up my abode amongst the shingle, in the hope that they might return there again for the night. Just as I wished and expected, and while it was yet light, they came and alighted about thirty yards from where I lay. Away went fatigue, hunger, and thoughts of home; in fact, the sight of the object of my day and night's solicitude made me a new creature. Off went the messengers of death. Two of the birds fell, the rest fled once more towards the sea. I followed, but had not proceeded far when I observed one falter; leaving its companions, it bent its course towards where I stood, and suddenly dropped almost at my very feet. As I picked up the little thing I could not but feel thankful that my patience and perseverance had been crowned with such success. It was the first little stint I had shot, and the only one I have ever seen here.

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* As the writer of this List is doubtless unknown to the majority of the readers of the 'Zoologist,' and as some of them might in consequence be inclined to think this an exaggeration, it may be as well to state that at one period of his life such proceedings were quite common with him. Four successive seasons he was never in his bed for about five months of each year, except on Saturday and Sunday nights, and when the weather was very stormy. His day's work done, with his gun upon his shoulder, his insect-box and appendages slung on his back, his plant-case by his side, and with a host of pill-boxes, small bottles, &c., to meet emergencies, away he bounded, with heart as light as a feather, either to the woods, fields or sea-shore, searching, as long as any daylight remained, for specimens in Natural History. Daylight gone, he would lie down for a nap; no matter whether by the side of a rock, a sand-bank, a hole amongst the shingle, in a ditch, under the cover of a bush, behind a dyke, or by the side of a tree, it was all one. There he lay till the first peep of morning, when he was at it again, and continued until he thought he had just sufficient time left to get to his work by the appointed hour; this, however, only when nothing new or rare attracted his notice, for in that case neither work nor home ever once crossed his mind until the object of his pursuit was either procured or entirely out of reach. During a tour between Banff and Aberdeen coastwise, which occupied six days, he rested only one night in bed, sleeping the remaining five by the way-side and amongst the bents by the sea-shore.

Temminck's Stint (*T. Temminckii*). Mr. Taylor, at one time gamekeeper to the Earl of Fife, is said to have shot a specimen on the river bank.

Dunlin (*T. variabilis*). These breed in a few of our marshy places, and may now and then be met with along the coast. Towards autumn large flocks appear, but do not remain long. Specimens may be picked up occasionally, during winter, almost pure white, except the bill, legs and feet, which retain their usual colour. This species appears to differ considerably in size, the legs and bills included, the larger birds often having the shortest bills.

Purple Sandpiper (*T. maritima*). A rock-loving species whilst with us, never leaving the rocks unless from necessity. They are gregarious, and huddle so closely together that I have known as many as twenty-three killed at one shot. I have killed them occasionally during summer, their colour then being of a rufous or rusty character, or more like that of the dunlin, the purple gloss and dark gray plumage of winter having all but disappeared.

Land Rail (*Gallinula crex*), "corn craig" or "crake" with us. Very sparingly distributed here. It arrives generally at the beginning of May, and departs usually in September, but I have seen it as late as December. These birds often feign themselves dead, when hard pressed, rather than fly,—a fact that may seem incredible to those who have paid no attention to such things. I was myself once completely baffled by a pair. Knowing they were in a small hay-field close by, I wished to obtain them, but being unable to raise them myself I got the assistance of a man and a dog. First the dog was sent, but it did not make them fly; we then went in ourselves, with a like result, but quite satisfied that they were still in the field. In this we were correct, for we had not long left the field when both commenced their "craik" again. At that time I was not aware of their power of dissembling. On another occasion I shot one while it was crying, and without seeing the bird. When shot it leaped about, like a rabbit will sometimes when hit. I rushed to the spot, and found it lying to all appearance dead. I picked it up, and was gratified at finding it an excellent specimen, in first-rate plumage, and its appearance very little injured by the shot; in fact, it was just such a specimen that I was in want of. The tip of one of the wings was broken, and that was all. Leaving the field, and bringing with me the bird, I sat down a little distance off. Having put a piece of cotton wadding down its throat and some rum to the wound, I laid it carefully down beside my gun. I had only sat a few minutes when a gentleman who was passing asked me what I had shot. I told him. "I am glad of that," said he, "for I have never seen one, although I have often heard them when out walking in summer." "Oh, well," I said, "you shall see as pretty a one as eyes ever beheld," at the same time turning round with something like energy to where the (as I thought) dead bird lay, in order to show it to the gentleman. Need I tell the sequel? "It's awa', sir." "What!" said the gentleman, "away?" "Then, it could not have been dead, as you led me to believe." "It's awa', sir," I again said; "an' fat's mair, I can assure ye it wis dead. I shot it dead; but, confound it, it's awa' for a' that, cotton wadding an' a'!" Yes, it was fairly off, and I was tricked; there is no doubt of that. Is it possible that these birds remove their eggs on its coming to their knowledge that their nests have been discovered? I knew of a nest which contained seven eggs. I took one, and, wishing to get all that the hen would lay, left the remainder untouched; I also carefully obliterated all my footmarks, to prevent others from suspecting anything if the nest was found. I went back three days afterwards, when, although there were no signs of human foot-prints, all the eggs were gone. A nearly black specimen was killed by a dog near here, some years ago; also one with only one leg, and but one fore toe to the remaining foot.

Little Crake (*G. pusilla*). Only one of this British rarity has been procured here, as far as I know. This occurred in March, 1852, at a place called Thornton, on the banks of the Isla. It was found dead by a girl tending cattle.

Moorhen (*G. chloropus*), or, as we have it here the "waterhen," for if any one were to speak here of the moorhen he would be looked upon as talking of the red grouse or "muir fowl." In consequence of having but few lochs, and those very small, we have not many of this species. A few about our rivers, and what little pieces of water we have, are all we can boast of.. They are excellent swimmers, although not web-footed; nor are they bad divers; and as skulkers they almost rival the land rail.

Water Rail (*Rallus aquaticus*). Far more scarce than the last, in fact it is almost a rarity. Specimens are now and then met with, and that is all. Perhaps their skulking habits prevent their being oftener seen.

Coot (*Fulica atra*). I believe this to be but an occasional visitor. A few specimens have been observed at different times. On the loch of Strathbeg (Aberdeenshire), where they are pretty numerous, they breed, and remain all the year round. In very wet summers the water of this loch rises at times considerably above the usual level; on such occasions I have seen the coot sailing nobly along with her nest beneath her.

Gray Phalarope (*Phalaropus platyrhynchus*). Three specimens were procured on the sands of Sandend, during the winter of 1840—1.

Rednecked Phalarope (*P. hyperboreus*). One specimen, a male, was shot on the beach here, in the spring of 1855.

Of the genus Anser we are remarkably scanty. Several kinds of geese have from time to time been procured, and not an autumn or spring passes without many large flocks being seen passing and repassing, but to what species they may belong it is difficult to say. That the graylag (*Anser ferus*), the brent (*A. bernicla*), the Egyptian (*A. ægyptiacus*), and the spurwinged (*A. gambensis*) have been met with is beyond doubt; but that these are all that have visited us it is hard to say. The brent is very numerous some seasons along the coast.

The genus Cygnus is still more scantily represented. Some of them visit us in passing to and from their breeding grounds; but I am not aware of any ever having been obtained.

Common Shieldrake (*Anas tadorna*). This pretty bird is only a winter visitor with us, and then not in large numbers.

Shoveller (*A. clypeata*). This pretty bird is quite a rarity here. In the latter part of the winter of 1837—8, which was of great severity here, a mutilated specimen of the shoveller was found dead amongst the rocks at Blackpots. This, a male in splendid plumage, is the only one I have seen or heard of here.

Gadwall (*A. strepera*). Another great rarity, so far as I am aware; one, a female, procured in the Diveron, by Dr. Leslie, about the time the shoveller above alluded to was picked up, is the only one I know of.

Pintail Duck (*A. acuta*). I remember being aroused rather early one morning, many years ago, by a loud knocking at the street door, and a person calling out at the top of his voice, "Rise, man! rise! I've brought a rare bird t' ye—a duke!" Being awake I immediately jumped up; but had I been sound asleep I believe the words "rare bird" would have awoke me. On seeing the bird I was delighted at beholding a beautiful male pintail. It had been shot the night before, on the Diveron. They have, I believe, been seen on the Spey also.

Wild Duck (*A. boschas*). Plentiful, especially in winter. Among the sandy bents almost close to the ocean's verge, and on the tops of our heath-clad hills and moors, I have found this species breeding; also on a tree about thirteen feet from the ground, and on a rock in the craigs of Alvah. This latter nest was placed on a ledge fully thirty feet above the water, and had eight or nine feet of perpendicular rock above it. There is a hill near here which I believe they used frequently to nestle on, but which they have now quite deserted,—a hill to which I have already alluded,—viz., Fern or Whin Hill, better known as Gallow Hill. It was on this hill, or rather piece of ground, for it hardly deserves the name of hill, that the celebrated freebooter M'Pherson finished his earthly career. It is a rough and stony place where he lies, covered with heath and whin. The pheasant and wild duck used not unfrequently to breed on his very grave. On a small island on the Diveron stood a tall old poplar. About five feet from the ground it divided into two arms, one stretching upwards, whilst the other bent over the river, and it is with this one that we are most concerned. In 1839 the Diveron, like the other rivers in Scotland, rose far above its usual height, so high indeed that it reached the arm of the tree alluded to, on which it deposited a good deal of rubbish. A female wild duck built her nest, a few years afterwards, amongst the *débris* thus left, and succeeded in rearing a brood of thirteen young ones. Neither nest nor bird, though known of by some salmon-fishers who had a station close by, were disturbed. One morning the female was observed by these men to leave her nest and fly up and down the water in an unusual manner. Presently she was joined by the male, and both disappeared beneath a bank a little above where the nest was. The fishermen, who had watched them, observed the female reappear alone, and, after flying up and down once or twice, again settled down on the water, just below the tree which contained the nest. After sailing about for a few minutes, she was heard to give a "quack," when down went something into the water, and presently a young one was seen by her side. Away she swam with it to the bank referred to, consigning it to the charge of the male; after which she returned, and, having again sailed about for a short time, gave another "quack," when down came another youngster, which she also led away to the bank. In this way she continued until all were safely removed, never giving more than one "quack," and never carrying more than one young one at a time; nor did she return after taking away the thirteenth.

Garganey (*A. querquedula*). Two specimens of this species were shot in December, 1840; and one is said to have been obtained at Cullen, in the spring of 1841.

Teal (*A. crecca*). Occasionally met with in winter.

Wigeon (*A. Penelope*). One of our rarest duck visitors. A splendid male specimen was killed by H. A. Rannie, Esq., of Boyndie, near his residence, in September, 1853.

American Wigeon (*A. americana*). A mutilated male specimen of this rare duck, shot on the Burn of Boyndie, in January, 1841, was for many years in my possession.

Scaup Duck (*A. marila*). Pretty frequent during winter.

Tufted Duck (*A. fuligula*). Very rare.

Goldeneye (*A. clangula*). A regular winter visitor, generally coastwise, but they are also met with on mill-dams many miles inland.

Longtailed Duck (*A. glacialis*). Abundant, but always keeping near the coast. I have shot them when in their full breeding dress, which gives them quite a different appearance. In spring they are very clamorous, pursuing each other through the water, and diving and skipping about like Merry Andrews. The noise they make on such occasions is so loud that I have heard it, on a still morning, nearly three miles distant. They are generally among the first to arrive and the last to leave.

Hooded Merganser (*Mergus cucullatus*). I was told by an old gunner and bird-stuffer that he had shot a specimen of this species, but I cannot vouch for the accuracy of the statement.

Redbreasted Merganser (*M. serrator*). Not very plentiful. All along the coast, in suitable localities, they may be met with, singly and two or three together, never more.

Goosander (*M. merganser*). A winter visitor. The male is a very showy gentlemen. As many as seven or eight specimens were procured at one shot, on the Diveron, by a Mr. Gellie. I have seen as many as five or six together, not more.

Great Crested Grebe (*Podiceps cristatus*). An occasional visitor.

Rednecked Grebe (*P. rubricollis*). Of more frequent occurrence, but generally in immature plumage.

Eared Grebe (*P. auritus*). Less frequent than the last.

Little Grebe (*P. minor*). A winter seldom passes without an opportunity occurring to obtain this species. I think it is one of the most expert divers we have.

Great Northern Diver (*Colymbus glacialis*). Some seasons pretty plentiful. Splendid specimens are at times procured, but they are generally immature.

Blackthroated Diver (*C. arcticus*) and Redthroated Diver (*C. septentrionalis*). Winter visitors, and, as far as I am aware, in about equal numbers. A few of them generally fall victims every spring by getting entangled in the bog-nets set for salmon. They not unfrequently visit our larger streams, where they make great havoc among the smaller of the finny tribe.

Brunnich's Guillemot (*Uria Brunnichii*) has been once met with.

Common Guillemot (*U. troile*), Ringed Guillemot (*U. lachrymans*), Black Guillemot (*U. grylle*), Puffin (*Mormon fratercula*), and Razorbill (*Alca torda*). All these species breed with us, but the common guillemot only rarely. As my late respected friend the Rev. Mr. Smith has already given (Zool. 2905) an account of the breeding-places of the Banffshire birds, I need only state that since that account was written the ringed guillemot has been discovered to breed here. I resolved to visit the rocks of Gamrie, to ascertain if the species nested there, but although I spent nearly two days in searching I failed to detect it. Sailing in a little bark, with a gentle breeze blowing, I had ample opportunity of viewing the various birds as they were approached and as they flew past. Passing in front of the several sea-fowl nurseries of Troup, I beheld scenes truly magnificent,—scenes which could not have failed to create feelings of the deepest interest, in a mind capable of appreciating the sublime and beautiful workings of Nature. Having landed at the most famed of these nurseries, in order to view the scene with advantage,—here, I thought, as I gazed at the white towering cliffs, which had laughed to scorn the angriest scowl of the most mighty wave that ever spent its fury against their base, and defied the stormiest blast from the icy North; where the largest gull in its mid-way flight appears no larger than the smallest of its kind; where the falcon breeds beside and in perfect harmony with the other inhabitants of the rocky cliffs; where multitudes of birds, of various forms and hues, from the snowy whiteness of the kittiwake to the sable dye of the croaking raven, have found a resting-place whereon to build their nests and deposit their eggs,—here, I thought, as I was about to leave the busy throng, even here, man, the noblest, although too often degrading himself far beneath the lowest of all animals, might learn lessons of industry and affection from these humble monitors of Nature. Though thus unsuccessful myself, I had only returned home a day when I had the pleasure of having one sent me by a friend whom I had asked to keep a look-out for it. I have procured several since, both in winter and summer; I have also been shown places in the cliffs where the fishermen say they know them now to breed.

Little Auk (*Alca alle*). A winter visitor. In December, 1846, a terrific sea-storm raged here for the greater part of the month; at its termination I counted between the Burn of Boyne and Greenside of Gamrie, a distance of about nine miles, nearly sixty of these little birds lying dead, besides a number of guillemots and razorbills. Great numbers were also found dead in the fields throughout the county. It is a grand sight to see one of these diminutive but intrepid creatures manœuvring with the impetuous billows of a stormy sea. Wave follows wave in rapid succession, bearing destruction to everything within reach; but the little auk, by Nature taught, avoids the threatened danger, either by mounting above the waves or by going between them, reappearing unhurt as they spend their fury on the unoffending shore. It has disappeared, and is nowhere to be seen. The eye wanders in vain amongst the turbulent surge, to catch another sight of the little sailor bird; and one unacquainted with such a scene would be apt to exclaim, "Poor little thing, it is killed, and buried amongst the foam." Patience, my friend, I would say. Look again. See, it is there once more, as lively as ever, and ready to master the next billow. It had but descended in search of food.

Cormorant (*Carbo cormoranus*). Frequent, except a short time during summer. A pair or two may breed with us, but that is all. Like the divers they destroy great numbers of fish.

Shag (*C. cristatus*). Only, I believe, an occasional visitor.

Gannet (*Sula bassana*). A spring and autumn visitor, and occasionally during summer and winter. When overtaken, as they sometimes are, by strong north winds from the sea-shore, I have known them driven to great distances inland, where they are frequently seen lying dead. Immature specimens are now and then procured during their autumnal passage, and from their different plumage are looked upon as distinct from the "solan goose," as the gannet is here called.

Sandwich Tern (*Sterna cantiaca*). An occasional visitor, generally in summer.

Roseate Tern (*S. Dougallii*). Two specimens have been obtained between Banff and Cullen.

Common Tern (*S. Hirundo*) and Arctic Tern (*S. arctica*). Annual visitors, generally in the autumn, some seasons in immense numbers. Although they do not breed with us, they do so on part of the sandy shores, &c., of the adjoining counties of Aberdeen and Moray.

Lesser Tern (*S. minuta*). This pretty little lady-like bird does not breed with us, but does so in the places mentioned for the two preceding. It is only an occasional visitor. About fifty years ago a specimen was shot on our links by an old gunner of this town. The bird being a stranger to him he carefully brought it to town to make inquiries. Ornithology, or in fact Natural History, was at that time, at least here, scarcely heard of; ministers, medical men and schoolmasters being the only persons at all acquainted with the subject. The bird was seen and admired by a great number of people, but no one had seen anything like it before. The minister was appealed to, but he could not say what it was. A medical man said to be learned in these things was then visited. Having put on his spectacles, after looking again and again at the bird he turned to its captor and exclaimed, "What do you say, sir,—this bird killed on our links?" "Yes, sir." "Killed in this country, on our links? Why, man, I can hardly believe you. It's not a bird of this country at all; it's a foreigner. I tell you it's a foreigner, and could not have been shot here." "Foreigner or no foreigner," said the captor, somewhat displeased, and taking up his bird, "it was killed at the sea-side here, say what you like."

Black Tern (*S. nigra*). I know only one instance of its having occurred here.

Sabine's Gull (*Larus Sabini*). I had an exciting chase after a specimen, but failed in capturing it; it was the only one I have seen or heard of here.

Little Gull (*L. minutus*). I believe only two specimens have been met with.

Masked Gull (*L. capistratus*). I am informed that two of these birds were killed about thirty years ago.

Blackheaded Gull (*L. ridibundus*). Like the common and arctic terns, this species, although it has no breeding-grounds with us, breeds on either side in great numbers, and is a frequent visitor here, chiefly in spring and autumn.

Kittiwake (*L. tridactylus*). Breeds with us, but not in such numbers as formerly.

Ivory Gull (*L. eburneus*). A female specimen, shot near here, January 29, 1847, is the only one I am aware of.

Common Gull (*L. canus*). Abundant during winter and spring, and parties may be met with all the year round. I believe it does not breed with us.

Iceland Gull (*L. leucopterus*). Sometimes, during winter, a specimen of this northern bird may be obtained, but mostly in an immature state of plumage.

Lesser Blackbacked Gull (*L. fuscus*). Met with now and then, but not in great plenty. It does not nestle here.

Herring Gull (*S. argentatus*). Breeds at Gamrie Head and at Traup. Numbers are taken when young by the fishermen and their children, and brought up quite tame, walking about the villages like poultry.

Great Blackbacked Gull (*L. marinus*). Like his lesser brethren, this gentleman is but a visitor here, and generally before he gets his black coat.

Glaucous Gull (*L. glaucus*). A female, in an immature state of plumage, was killed at Gamrie.

Common Skua (*Lestris catarractes*) and Richardson's Skua (*L. Richardsoni*). Both are to be met with as visitors, the latter the rarer of the two.

Fulmar Petrel (*Procellaria glacialis*). An occasional winter visitor. I had a specimen sent me from Gamrie which approached a boat so closely that one of the fishermen knocked it down with an oar; this was several miles out at sea.

Great Shearwater (*Puffinus major*) and Dusky Shearwater (*P. obscurus*). Only winter visitors.

Storm Petrel (*Thalassidroma pelagica*). A visitor, like the rest of its kindred, but more frequent, and may be met with at intervals all the year round. The superstitious dread of this little bird by sailors and fishermen is well known.

With the storm petrel ends my List of the Birds of Banffshire. Many species given as "rare" may turn out to be of frequent occurrence, and many given as "occasional visitors" may prove to be natives. Species, too, not mentioned in this List may have to be included in the birds of the county; and no one will be more pleased to hear of such additions than myself.

THOMAS EDWARD.

Note on the Barn Swallow of Jamaica (Hirundo americana).—I observe that [the late lamented] Mr. Osburn, in his Jamaica notes, (Zool. 6878) refers to a "seventh species of Hirundine," which he says "might easily be taken for the English bird, H. rustica, but it is, I think, ruddier beneath, and has on the outer vane of each tail-feather a conspicuous white oval spot. It may possibly prove to be the American barn swallow. That the bird so imperfectly described is the Hirundo americana I have little doubt, but then the white spots would be on the inner webs of each tail-feather, excepting the two middle ones, as in our chimney swallow, which I have remarked in my Canada notes, that it greatly resembles (Zool. 6705). "Its tail (Hirundo americana) is forked; and this bird, in shape, colour and manner of flight, bears so strong a resemblance to the chimney swallow of Europe, that even an ornithologist might be excused for mistaking it on the wing." Possibly the above may be a misprint, for the following note by Mr. Gosse, instead of clearing up the point, leaves it more obscure than ever. He remarks: "Or H. fulva, perhaps, but neither of these species has any white on the inner vanes of the tail-feathers." Having shot and closely examined more than one barn swallow — which are now on the table before me—I can answer for the correctness of Wilson's description (see vol. ii. p. 43):—"The barn swallow of the United States has hitherto been considered by many writers as the same with the common chimney swallow of Europe. They differ, however, considerably in colour, as well as in habits, &c." But even Macgillivray seems to have been impressed with the idea of their being the same; for he observes (vol. iii. p. 572):—"If this species be identical with the American bird bearing the same name, as it appears to be, although several ornithologists have considered it different, &c." I am one of the nonconformists; for of its being a distinct species I have not a shadow of doubt; for not only does it differ materially in colour, but in size and habits. Never building in chimneys, it cannot, with propriety, be named the chimney swallow. As I have not a skin of Hirundo fulva to refer to, I must quote Wilson and Bonaparte's Ornithology, in refutation of Mr. Gosse's notion that it may be a bird of this species that has been remarked on by Mr. Osburn (vol. iv. p. 79:)—

"The exterior tail-feather is slightly edged with whitish on the inner vane." "The most striking characteristic of Hirundo fulva is its even tail." Yet Mr. Gosse says, that "perhaps" the "long fork-tailed" swallow, noticed by his ornithological friend, may be the Hirundo fulva. Moreover, the latter is but "five and a half inches long," whereas the male of Hirundo americana — according to my notes — measures seven inches and two-tenths in length, and thirteen inches in extent of wings. But even the "pale rufous ash-colour of the breast," not to mention the "whitish under parts" of the Hirundo fulva, might have convinced Mr. Gosse that this could not possibly be the "seventh species of Hirundine," observed by his Jamaica correspondent.—*Henry Hadfield; Ventnor, Isle of Wight, March* 8, 1860.

Note on the Piramidigs of Jamaica (*Chordeiles*).—The peculiarity of flight in the piramidig, remarked on by Mr. Osburn, is very similar to what I had observed in the Caprimulgus americanus (Zool. 5803): —"It was about half-past four o'clock, p.m., when my attention was first directed to a flight of these most elegant birds; and a more beautiful sight, at least for an ornithologist, could not well be desired; for some forty or fifty were to be seen within a very narrow circle hawking flies; and their manner of doing so, as well as their rapidity of flight,—in the distance so similar to that of the swallow, — at first inclined me to believe that it was a flock of swifts approaching, but I was soon undeceived. They were now to be seen passing over-head at the distance of thirty or forty yards. Their flight was circular, but they were constantly deviating from this order of progression by momentary and sudden darts after the flies; often, when descending, raising the wings so as to bring the points nearly together, after the manner of the pigeon tribe. Their flight was most buoyant, and occasionally bat-like, &c."—*Id.*

Sun Bird: correction of an error. — I was in North America when my Indian notes were published, or I might have replied to the editorial remark on my notice of the Indian humming bird (Zool. 5797), which I had therein erroneously named the Mango humming bird; but from the prefatory remarks, &c., it might have been gathered that my acquaintance with the birds of the Carnatic was but slight. Having consulted an old work, I found the Mango humming bird mentioned as a native of the Indies, *i. e.* West Indies. However, there can be no doubt it was the beautiful little sun bird that I so frequently observed — more than thirty years ago — hovering over the flowering shrubs in my garden at Trichinopoly, and which, to my unpractised eye, seemingly possessed all the characteristic features of the true humming bird. I also observe that the Rev. J. C. Atkinson, in a note appended to his paper on "Reason and Instinct," seems to demur to my construction (Zool. 5648) or interpretation of his statement. He pointedly refers to Montagu's Dictionary, *i. e.* Ornithology, but ignores Temminck and the other authors quoted; though their evidence directly tends to prove that the inspired writer's "words *are* characterized by precision and scientific accuracy," and not mere "allusions and references," as asserted. By consulting the Dictionary, not Montagu's, it will be found that "yea," in the sense used by Jeremiah, means — *it is so.* Here is no want of "precision." Then follows the expression —"Knoweth her appointed times," but this likewise, I am to be told is a mere "allusion." Finally, there is the information, that they "observe the time of their coming," *i. e.* obey an instinctive law of Nature; a knowledge of which, is surely a proof of "Science." Had the remarks of the reverend author been merely personal, they might have remained unnoticed, but I would not have it even appear that the inspired writer had "no information" on the subject.—*Id.*

Occurrence of the Goatsucker (Caprimulgus europæus).—On February 19th, when walking on the public road near Steep Hill, I was surprised at seeing a bird of this species fly past me.—*Id.*

Birds observed between New York and Glasgow :—

Great Tern (*Sterna Hirundo*). May 29th. On leaving the harbour of New York, observed some terns, belonging, I think, to this species; also a few gulls, but they were not identified.

Wilson's Storm Petrel (*Thalassidroma Wilsoni*). Numbers of these birds were seen, and they continued with us till we reached the longitude of Cape Race, when they gradually disappeared. Though several lines had been suspended at the stern with a view of entangling them, none were secured. They frequently approached within a few yards of the steamer, so that the different shades of the plumage could be observed; the wings are tinged and spotted with reddish brown. The tail appears slightly forked, or rather doubly emarginate, in consequence of the outstretched legs protruding considerably beyond it; and which might possibly lead a casual observer—who had never before seen them on the wing—to mistake them for the fork tailed petrel. On any refuse being thrown overboard they invariably gathered round it, but rarely settling on the water for more than a few seconds at a time, and then with upraised wings.

Skua Pirate Bird (*Lestris catarractes*). Saw what I believe to have been birds of this species, also a few gulls. On getting to the eastward of Newfoundland the former disappeared.

Guillemot (*Uria troile*). When about a hundred and fifty miles to the southward of the Cape, numerous flocks of guillemots frequently passed within a few yards of the ship, apparently unconscious of danger. St. John's appears to be one of their chief breeding places, vast numbers of their eggs being found scattered on the rocky and stony declivities of the head-lands of this bold coast; I saw bushels exposed for sale in July, 1857.

Parasitic Skua (*Lestris parasitica*). On the 6th of June, when some degrees to the eastward of Newfoundland, and about half the passage had been accomplished, observed a white skua, belonging, I have no doubt, to this species. After hovering over the ship it alighted on the mast-head. On the 7th, five more were seen following the course of the steamer, but often at such an altitude as to appear mere specks in the sky. The long-pointed wings were seemingly much curved, and I had also remarked on the previous day, when the bird was seated on the truck, that the centre tail-feathers are very elongated, which agrees with Temminck's description, "longueur des filets, de 6 à 8 pouces." He also observes of its habits, "très abondant sur les bancs de Terre Neuve."

White-winged Gull (*Larus leucopterus*). June 8th: there are generally a few gulls in sight, but to-day I observed them following in the wake of the vessel, and wheeling round as they approached the stern; their flight is most buoyant. It is the same species that I had noticed on the outward voyage in July, 1857, and which I have now no reason to doubt is the Larus leucopterus. The head, neck and belly are white; the upper parts cinereous or bluish gray. But its distinguishing mark, as I formerly observed, is the patch of white on the margin of the gray wing, which looks as if cut out. Temminck had noticed this, for he says, "rémiges terminées par un grand espace blanc."

Ash-coloured Sandpiper (*Tringa cinerea*). When in soundings, off Newfoundland, several flocks of light gray birds, of this species I believe, — which Wilson says is in summer "of a pale drab or dun-colour," — were seen skimming over the water, with a rapid and direct flight. Though frequently passing at no great distance, they were at times scarcely discernible amid the white-capped undulating waves; so possibly they may have been the sanderling plover.

Kittiwake (*Larus tridactylus*). June 9th: observed a few gulls of a different species. June 10th: the small gulls, seen yesterday, are still following us, and prove to be kittiwakes. The wings are elongated and tipped with black; the back of a darkish gray. Bill short and of a light horn-colour; the head and the whole of the under parts pure white. Feet and tarsi black.

Gannet (*Sula alba*). June 11th, 6 a.m.: in view of the north-west coast of Ireland; at 11, a.m., when abreast of Tory Island, saw some small flocks of gannets, flying in files like geese.

Guillemot (*Uria troile*). June 11th: great numbers of these birds were seen; and seemingly so little heeding the approach of the steamer, that they were frequently almost under the bows before taking wing or diving.

It may appear somewhat strange that so few birds are seen in a voyage of two thousand miles, but it should be borne in mind that in the fathomless ocean their means of subsistence must be very precarious, and that the glaucous gull, which, according to Dr. Richardson (see Macgillivray, vol. ii. p. 560), swallows two auks at a meal, would necessarily in its wide-world wanderings be reduced to more humble fare, even vegetable diet,—a share of the gulf-weed, with the storm petrel, for instance. On the outward passage I did not meet with a greater variety, for though there was a dark gull seen, it was probably the young of Larus leucopterus, though apparently somewhat larger than the adult, but the dusky plumage may have deceived me as to its size, for I was at first inclined to believe that it was an immature glaucous, which is described by Temminck as having "les nuances générales des teintes grises et brunes."—*Id.*

On the Nidification of the Kingfisher (Alcedo Ispida).—Ornithologists are divided in opinion as to whether the fish-bones found in the cavity in which the kingfisher deposits its eggs are to be considered in the light of a nest, or as merely the castings from the bird during the period of incubation. Some are disposed to consider these bones as entirely the castings and fæces of the young brood of the year before they quit the nest, and that the same hole being frequented for a succession of years, a great mass is at length formed; while others believe that they are deposited by the parents as a platform for the eggs, constituting in fact a nest; in which latter view I fully concur, and the following are my reasons for so doing:—On the 18th of the past month of April, during one of my fishing excursions on the Thames, I saw a hole in a precipitous bank, which I felt assured was a nesting-place of the kingfisher, and on passing a spare top of my fly-rod to the extremity of the hole, a distance of nearly three feet, I brought out some freshly-cast bones of fish, convincing me that I was right in my surmise. The day following, the 9th of May, I again visited the spot with a spade, and, after removing nearly two feet square of the turf, dug down to the nest without disturbing the entrance-hole or the passage which led to it. Here I found four eggs placed on the usual layer of fish-bones; all of these I removed with care, and then filled up the hole, beating the earth down as hard as the bank itself, and replacing the sod on the top in order that barge-horses passing to and fro might not put a foot in the hole. A fortnight afterwards the bird was seen to leave the hole again, and my suspicion was awakened that she had taken to her old breeding-quarters a second time. The first opportunity I had of again visiting this place, which was exactly twenty-one days from the date of my former exploration and taking the eggs, I again passed the top of my fly-rod up the hole, and found not only that the hole was of the former length, but that the female was within. I then took a large mass of cotton wool from my collecting-box, and stuffed it to the extremity of the hole, in order to preserve the eggs and nest from damage during my again laying it open from above. On removing the sod and digging down as before, I came upon the cotton wool, and beneath it a well-formed nest of fish-bones, the size of a small saucer, the walls of which were fully half an inch thick, together with eight beautiful eggs and the old female herself. This nest and eggs I removed with the greatest care; and I now have the pleasure of exhibiting it to the Society, before its transmission to the British Museum, the proper resting-place of so interesting a bird's nest. This mass of bones then, weighing seven hundred grains, had been cast up and deposited by the bird or the bird and its mate, besides the unusual number of eight eggs, in the short space of twenty-one days. To gain anything like an approximate idea of the number of fish that had been taken to form this mass, the skeleton of a minnow, their usual food, must be carefully made and weighed; and this I may probably do upon some future occasion. I think we may now conclude, from what I have adduced, that the bird purposely deposits these bones as a nest, and nothing can be better adapted, as a platform, to defend the eggs from the damp earth.—*John Gould; in 'Zoological Society's Proceedings,'* 1859, p. 152.

On the Habits of the Black-winged Stilt, as observed on its occurrence in Sussex.—On the 17th of May last a specimen of the black-winged stilt (*Himantopus melanopterus*) was killed on the banks of a small pond about a mile from this place, in a partially enclosed district surrounded by unreclaimed moorland, near the junction of Midhurst and Bepton Commons. This is the first time that the stilt has ever been obtained or seen in the county of Sussex, and it would appear to be nearly equally scarce in all parts of the British islands. Opportunities for observing the habits and manners of these rare and accidental visitors so seldom occur, that I shall make no apology for the length of this communication. Apart, however, from the rarity of the species, there are circumstances attending the occurrence of the individual in question which appear to me to be especially worthy of notice, as tending to throw some light on its remarkable, and, to the ordinary observer, grotesque external conformation. The pond to which I have alluded is very shallow; the depth of the water, even at fifteen paces from the shore, scarcely exceeding a foot. About that distance from the banks the surface was covered with numerous blossoms of the water crow-foot (*Ranunculus aquatilis*). On examining these next day, and frequently afterwards during last month, I found them inhabited by numerous minute Dipterous and Coleopterous insects (small flies, midges and beetles), comfortably nestled at the bottom of the flowers among the stamens, from which, indeed, none but the most delicate and attenuated instrument would be capable of extracting them without at the same time injuring the blossoms. Now, not one of our wading or swimming birds, except the stilt, possesses a beak perfectly adapted to this purpose. But the stilt has a bill almost as finely pointed as that of a humming-bird; and those which make the nearest approach to it, as some among the smaller Tringæ, want the accompaniment of length of limb — that unusual development of tibia and tarsus — to enable them to wade to a sufficient distance from the shore. The bird was first noticed by an intelligent lad, the son of a small farmer of the name of Pearson, while driving the cows home to be milked in the evening. It was then standing nearly up to its belly in the water, and rapidly extracting the insects from the flowers, or, as the boy supposed, picking the petals themselves. It allowed him to approach within twenty yards before it took flight, when it extended its long red legs behind it, after the manner of a heron, and, alighting again on the opposite bank, immediately recommenced wading out to the water-plants. Young Pearson then hastened home to his father, who lives at a short distance from the pond, and the latter, hurrying to the spot with a loaded gun, found the bird employed as before among the flowers of the water crowfoot. But it was now exceedingly shy and wary of the gun, flying from one side of the pond to the other, before Pearson could get within shot (but never uttering any cry or sound), so that at last he found it necessary to resort to stratagem, and to endeavour to "stalk" the bird. This a newly-made ditch and bank, one extremity of which approaches within a few yards of the water's edge, enabled him to do successfully. On raising his head above the bank, just before he fired, he perceived the stilt within twenty yards of him, knee-deep in the water, in the midst of a cloud of gnats and midges, at which he was snapping right and left, much after the manner (to use Pearson's own simile) of a dog when teased by the flies in hot weather. The bird, fortunately but little injured by the shot, was brought to me on the following morning, and, on subsequent dissection, proved to be a female. The ovarium contained several eggs, the largest of which was about the size of a pea. The stomach was crammed with beetles and gnats in a half-digested state; the elytra of the former showing that different species had been captured. After the first pleasurable sensations on possessing and examining in the flesh a perfect specimen of so rare a visitor had passed away, I could not help being struck with the remarkable tenuity of the tips of the mandibles, as well as by the more obvious peculiarity from which the bird has derived its name (the extraordinary length of its legs); but after listening to the simple story of George Pearson and his son, I perceived that the mystery was solved, and that here was a new instance of the wonderful adaptation of means to an end, of structure to habits, such interesting examples of which are continually presenting themselves to the observant naturalist.—*A. E. Knox; in the* '*Ibis*,' i. 395.

Occurrence of the Cream-coloured Courser at Braunton Burrows.—While shooting on Braunton Burrows, about ten days ago, I observed a pair of strange birds in the air flying round one of the large ponds left by the recent rains: after a little while they settled on the margin of the pond; they were then about three hundred yards from me: by keeping out of sight behind the sand-hills I was able to get within a hundred yards of them, and I was greatly surprised, on looking over the brow of the hill, to see a fine pair of the cream-coloured courser (*Cursorius Isabellinus*), one an adult male in splendid plumage, the other a female or young bird of the year in immature plumage; they were accompanied by a single lapwing, which kept incessantly getting up and flying over their heads screaming, which caused the birds to be wild. I waited about half an hour behind the hill, in the hope that they would walk within shot, but they were wise and would not, so I tried to walk within shot of them, as I found sitting-still rather unpleasant, particularly as the day was exceedingly windy and cold. The birds, however, would not wait, but flew off directly I showed myself, and pitched again close to the next pond some distance off; I followed, but could not get near them, and this time they flew right up into the clouds out of sight, uttering a peculiar cry. I am quite certain as to the identity of the species, else I would not trouble you with this. — *Gervase F. Mathew; Raleigh House, near Barnstaple, April* 2, 1860.

The Great Auk. — The great auk has not been met with by any of the modern Arctic Expeditions. I was told in South Greenland that some, twenty-five years ago a young specimen was obtained, but am not at all certain of the fact. The resident Europeans are quite aware of the value attached by naturalists to the bird, so have kept a sharp look-out for it. I have myself collected birds during my four arctic voyages, all of which are now in the museum of the Royal Dublin Society. I am not aware of there being any new species among them. — *F. J. M'Clintock; in a letter to R. Champeen, Esq., Scarborough.*

Use of the Albatross.— My son, who has just been round the Cape, brought me, as a curiosity, the radius or small bone of the wing of an albatross, which is much in request among sailors, as making an excellent tube for a pipe. The one I have is long, perfectly smooth, and black from smoking. He has seen them considerably longer. The following *jeu d'esprit*," written by a friend of his on the subject, shows the practical turn that Jack's mind has taken since the days of Coleridge's 'Ancient Mariner:'—

A dead loss was the albatross
  The "Ancient Mariner" slew;
The modern Tar, acuter far,
  Makes him into a stew.

Day after day did that silly old man
  Over his dead bird cry;
The "Mid," more ripe, of its wing makes a pipe,
  And smokes therein "Bird's-eye."

—*E. Horton; Wick, Worcester, March* 31, 1860.

Account of a Visit to a Nesting-place of the Frigate-bird (Fregata Aquila, *L.*).— On the 1st of January, 1858, we went off in a boat with four rowers to visit an island some four or five miles from Tigré Island, in the Bay of Fonseca, on the Pacific coast of Honduras. It is called Bird Island, and is not more than an acre in extent, and of an oblong shape. At one end the beach is sandy, and at low water one can walk across to another island close adjoining. At the other end the shore is rocky, and it is much the same at the sides, the beach being strewn with large volcanic stones. The surface of the island is some thirty or forty feet above the sea-level; it is covered with long grass, and there are also a few trees and low shrubs — mangroves (*Rhizophora mangle*, Linn.)—growing in places, especially about high water-mark. At a distance the most conspicuous object was a numerous flight of frigate-birds soaring over the island. As we approached, large white patches, caused by the droppings of the birds, became visible. We landed on the flat sandy beach, and in a few minutes I had shot a pair of tiger bitterns (*Tigrisoma tigrinum*), which allowed me to approach without any difficulty. Besides these and the frigate-birds we saw no birds on the island, except a few pelicans, some large Accipitres and a single booby (*Sula fusca*), which had its nest on a low tree, in company with the frigate-birds. The whole island was appropriated by the latter. Nearly every tree and bush, both high and low, was covered with birds and their nests. The latter were mostly composed of a few sticks laid crosswise, hardly as much in quantity as in the nest of the ring dove (*Columba palumbus*). Each nest contained a single egg, about the size of a hen's egg, and of a chalky whiteness. We brought away nearly a hundred of them. Some were quite fresh, and others had been sat upon some days. Although the nests were upon low bushes, still they were placed just too high for one to reach the eggs without climbing. Many of the nests were on the mangrove bushes which were growing just above high water mark, so that we could see into them when standing on the bank of the island, which was at a higher level. Some of the birds were sitting on their nests, and others were perched upon the branches. By firing into the mass I might have killed a dozen at a shot; but shooting would have been an absurdity, for I could have obtained any number with a stick. The difficulty was to get them off their nests. Shouting had little or no effect, and even the report of a gun would only rouse a few, who would frequently settle again on the bushes. I threw some stones among them, without producing much result, and even tried to poke them off their seats with my gun; but they merely snapped their beaks at me in retaliation. All this time there were thousands of other birds soaring in the air a little way above our heads. I observed that the frigate-birds were of three different plumages. As there were birds of all three sorts sitting together, and with their nests in the same bushes, I concluded that they were of one and the same species — males, females and immature birds. Some have the head and neck white, the beak white, the feet and legs bluish white, the belly white, and the wing-coverts grayish brown. Others have the legs and feet black, and are black all over, with a greenish metallic tinge on the back. These have a bright scarlet pouch, which they inflate to the size of an ostrich's egg while on the wing. The boatmen informed me that these were the male birds. Others, probably immature birds, had the head black, the throat white, and the legs and feet pink. All had long, black, forked tails. I obtained a specimen of each, but did not preserve them, as I had much to do, and besides they are stinking birds to handle, as bad as or worse than the turkey buzzard (*Cathartes*). The pelicans have also a breeding-place in Fonseca Bay, but it is in an island at some distance from the one in possession of the frigate-birds.—*G. C. Taylor; in the 'Ibis,'* i. 152.

Great Mortality amongst Woodcocks (Scolopax rusticola).—Woodcocks have been extremely scarce this season, which scarcity is accounted for by the fact that hundreds of thousands of these birds were drowned during their migration towards these shores, on the night of the terrific gale in which the "Royal Charter" was lost. In this county, which is not a bad locality for this species, scarcely a pair have been procured; sportsmen have hunted for this favoured and dainty morsel, but in vain. — *S. P. Saville; Jesus Terrace, Cambridge, March* 14, 1860.

A Kittiwake Gull (Larus tridactylus) *driven Inland by the late Terrific Gales.*—On the 28th inst., the day of the tremendous hurricane, a labouring man picked up, in an entirely exhausted state, a kittiwake, in adult plumage, by the side of the River Carn: the bird allowed itself to be approached and taken up, so great was its exhaustion.—*Id.*

Dates of Arrival of Migratory Birds. — April 19th, 1859: I heard the blackcap and the willow wren in the garden. April 23rd: saw a pair of swallows hawking over the round pond; also saw a redstart. May 1st, Sunday afternoon: saw sand martins and house martins flying together about the heath. May 6th, at Chester: saw swifts darting about and frequently resting on the old church-tower by the Cheese Mart; they seemed tired and resting after their long journey. September 21st: hundreds of swallows resting on the heath.—*Matthew Hutchinson; Blackheath, Kent.*

The Snake Stone. By EDWARD NEWMAN.

I am rejoiced to find in Mr. Gosse an advocate for inquiry into the long-accepted belief in certain natural phenomena which we cannot test by the evidence of our senses, as we sit in our well-warmed museums, surrounded by the trophies of the bird-stuffer's imagination. The belief in what we see is far more dangerous than the belief carefully deduced from evidence of what we cannot see. Many a stuffed owl is more improbable than a sea serpent: a snake stone is a valuable truth by the side of a British black woodpecker, the skeleton of a mermaid or a talking fish. I have often been astonished at the ridicule thrown over facts that we cannot understand. Men of learning who laugh at a phenomenon they have not seen always remind me of giggling girls who titter when they hear two persons speak any language but their own: the cause of cachination is the same, simple ignorance. The 'Zoologist' shall always be open to discussions on either of the subjects mentioned by Mr. Gosse, and it gives me great pleasure in this number to identify a sea serpent, and to prove, from the evidence of a witness whose veracity is unquestioned, the valuable properties of the snake stone. I quote Sir Emerson Tennant's 'Ceylon.'

"The use of the Pambo-Kaloo or snake stone, as a remedy in cases of wounds by venomous serpents, has probably been communicated to the Singalese by the itinerant snake-charmers who resort to the island from the coast of Coromandel; and more than one well-authenticated instance of its successful application has been told to me by persons who had been eye-witnesses to what they described. On one occasion, in March, 1854, a friend of mine was riding, with some other civil officers of the Government, along a jungle path in the vicinity of Bintenne, when they saw one of two Samils, who were approaching them, suddenly dart into the forest and return, holding, in both hands, a cobra de capello which he had seized by the head and tail. He called to his companion for assistance to place it in their covered basket, but, in doing this, he handled it so inexpertly that it seized him by the finger and retained its hold for a few seconds, as if unable to retract its fangs. The blood flowed, and intense pain appeared to follow almost immediately; but with all expedition, the friend of the sufferer undid his waistcloth, and took from it two snake stones, each of the size of a small almond, intensely black, and highly polished, though of an extremely light substance. Then he applied one to each wound inflicted by the teeth of the serpent, to which the stones attached themselves closely, the blood that oozed from the bites being rapidly imbibed by the porous texture of the article applied. The stones adhered tenaciously for three or four minutes, the wounded man's companion in the meantime rubbing his arm downwards from the shoulder towards the fingers. At length the snake stones dropped off of their own accord; the suffering appeared to have subsided; he twisted his fingers till the joints cracked, and went on his way without concern." Here follows a similar instance, which there is no need of quoting: the question occurs, What is this snake stone? and does it perform the cure which it appeared to perform? There may be some difference of opinion on this second point; it may therefore be left an open one, but What is the snake stone? here is Sir Emerson Tennant's reply.

"As to the snake stone itself, I submitted one, the application of which I have been describing, to Mr. Faraday, and he has communicated to me, as the result of his analysis, his belief that it is a piece of charred bone which has been filled with blood, perhaps several times, and then carefully charred again. Evidence of this is afforded, as well by the apertures of cells or tubes on its surface, as by the fact that it yields and breaks under pressure and exhibits an organic structure within. When heated slightly, water rises in it, and also a little ammonia; and if heated still more highly in the air, carbon burns away, and a bulky white ash is left, retaining the shape and size of the stone. This ash, as is evident from inspection, cannot have belonged to any vegetable substance, for it is almost entirely composed of phosphate of lime." Mr. Faraday adds that "if the piece of matter has ever been employed as a spongy absorbent, it seems hardly fit for that purpose in its present state; but who can say to what treatment it has been subjected since it was fit for use, or to what treatment the natives may submit it when expecting to have occasion to use it?"—Vol. i. p. 200.

"The probability is that the animal charcoal, when instantaneously applied, may be sufficiently porous and absorbent to extract the venom from the recent wound, together with a portion of the blood, before it has had time to be carried into the system; and that the blood which Mr. Faraday detected in the specimen submitted to him was that of the Indian on whose person the effect was exhibited, on the occasion to which my informant was an eye-witness. The snake-charmers from the coast of Ceylon profess to prepare the snake stones for themselves and preserve the composition as a secret. Dr. Davey, on the authority of Sir Alexander Johnson, says the manufacture of them is a lucrative trade, carried on by the monks at Manilla, who supply the merchants of India, and his analysis confirms that of Mr. Faraday."

EDWARD NEWMAN.

The Great Sea Serpent.—The following extract from the log of the "British Banner," which arrived at Liverpool on Sunday 18th March last, appeared in the 'Liverpool Daily Post' of March 20th. "On the 25th April, in latitude 12° 7″ east, and longitude 93° 52″ south, felt a strong sensation as if the ship were trembling. Sent second mate to see what was up; the latter called out to me to go up the fore-rigging and look over the bows. I did so, and saw an enormous serpent shaking the bowsprit with his mouth. There was about thirty feet of the serpent out of the water, and I could see his tail in the water abaft of our stern; must have been at least three hundred feet long; was about the circumference of a very wide crinoline petticoat, with black back, shaggy mane, horn on his forehead, and large glaring eyes, placed rather near the nose, and jaws about eight feet long. He did not observe me, and continued to shake the bowsprit and to throw the sea alongside into a foam until, the former came clear away of the ship. The serpent was powerful enough, although the ship was carrying all sail, and going at about six knots at the time he attacked us, to stop her way completely. When the bowsprit with the jibboom sails and rigging went by the board, the monster swallowed the foretopmast staysail and flying jib, with the greatest apparent ease; he also snapped the thickest of the rigging asunder like thread. He sheered off a little after this, and returned apparently to scratch himself against the side of the ship, making a most extraordinary noise resembling that on board a steamer when the boilers are blowing off. A whale breached within a mile of the ship at this time, and the serpent darted off after it like a flash of lightning, striking the vessel with his tail, and staving in all the starboard quarter galley. Saw no more of it, but caught a young one in the afternoon, and brought it on to Melbourne.—*William Taylor, Master, British Banner.*" (The "British Banner" arrived here on Sunday, and is now in the Albert Dock. Captain Taylor declares that the above statement is perfectly correct.—*Editor Daily Post*).

[It is impossible for any story to read more like a hoax than this, but I had ready means of procuring, through a friend at Lloyd's, the information that there is such a ship as the "British Banner," that she is commanded by Mr. William Taylor, a respectable and trustworthy gentleman, and that she did arrive at Liverpool on Sunday, 18th March, last past, and is now in the Albert Dock. Armed with this information, I wrote to Captain Taylor, who has replied in the most courteous

manner: he confirms the above statement, adding that he sent it to the "Daily Post" himself, and adding also that the young one reported to have been caught was presented to the Museum at Melbourne, where it was thoroughly inspected and pronounced to be a veritable sea serpent.—*Edward Newman*].

An Account of the Bermudian Riband Fish.

By J. Mathew Jones, Esq.

[I have received the following particulars of this most interesting capture from an old and valued correspondent of the 'Zoologist.' It must be read in connexion with a previous note on the same animal in the April number of the 'Zoologist' (Zool. 6934).—*Edward Newman*].

Order ACANTHOPTERYGII.
Family CEPOLIDÆ.
Genus GYMNETRUS.

Body attenuate, compressed, naked, tuberculate; cuticle, a silvery covering of metallic lustre. Length, from facialto caudal extremities, sixteen feet seven inches. Depth, at fourteen inches from facial extremity, nine inches, and increasing gradually to near the ventral extremity of the stomach, when it attained its greatest depth of eleven inches, and then decreased by degrees to the caudal termination. Width, at the same distance and through the spinal column, two and a half to three inches.

These dimensions are in the extreme.

From the frontal extremity of the caput (excepting a slight depression at the occiput) to the position at which the above dimensions of depth and width were taken, a gradual elevation of the dorsal ridge took place, and from the capital portion of this ridge arose at equal distances from each other, a series of ten or eleven erect, quill-like, flexile filaments, from two to three feet in extent, gradually tapering from base to apex, and possessing, in the case of the three longest, lanceolate points. These capital filaments were, with the exception of the three anterior ones, unconnected by membrane. From this series of lengthened filaments, all along the back, from head to tail, extended a series of intermittent fins, so closely situate to each other as to present the appearance of a single fin, and having the spinose rays of each individual fin joined by the connecting membrane. The ventral fins were entirely destroyed, save a portion of the right ventral, which is sufficient to show that it was composed of two consistent bony rays, which probably extended some distance from the body and must have formed a powerful engine of direction. The pectorals were almost entirely destroyed, although the base of the right pectoral was sufficiently complete to enable me to state that it contained twelve spines. Anal and caudal fins absent.

Head truncated, compressed; facial outline of a dark colour.

Mouth so damaged as not to be positively determinable as regards form and appearance, but from the portions of jaw still remaining I should pronounce it malacostomous.

Eyes fourteen lines in diameter, slightly depressed. Irides three and a half lines in width, of a bright silver, encircling pupils of a somewhat oval shape, and, in colour, a light transparent blue.

Stomach: intestinal chamber, extending from beneath the gills to the anal extremity, five feet. Unfortunately this chamber had been opened and its contents partially injured before I saw the specimen, but a large proportion of milt, intestine, &c., has been preserved, including the major portion of the swimming bladder, which for so large a fish may be considered small. Its colour a bright scarlet. This swimming bladder contained a large amount of oily matter, and a piece thrown on the ruffled surface of the water immediately stilled the agitation.

Gill-rays eight in number, four to a side, crimson, flabellate; the anterior pairs furnished with double rows of flabels, having the internals white, and armed on their inner sides with minute dark-like appendages.

Gill-covers bony, radiate, not entirely covering the gills.

Teeth: no appearance of any.

In concluding the above description, I must not omit to state that it was a male fish, and from the extremely fragile nature of its various parts, I may venture to express an opinion that it had by no means attained maturity. I may also remark that my measurements were taken twenty-two hours after death, during which time it had lain exposed on the rocky shore.

This genus of acanthopterygious fishes is of a form so thin and flat, in proportion to its length, as to have obtained among the ancient ichthyologists the name of "riband fish." Although several species are known to Science, yet they are all of diminutive size in comparison with the individual now obtained; Gymnetrus Hawkenii, G. Banksii and G. Glesne are occasionally found in the British seas.

So little appears to be known of this singular tribe of fishes that, even in the present advanced state of marine zoology, their habits, haunts, &c., remain blanks in the Book of Nature, and will probably long continue so, unless opportunities like the present should occur, to enable us to add new facts in the history of these remarkable creatures.

The most notable fact, however, in connexion with the capture of the present specimen, will doubtless be the interest and attraction it will produce in the scientific world, for most assuredly we have in the specimen now before us many of the peculiarities, save size, with which the appearance of that hitherto apochryphal monster, the "great sea serpent," as detailed by navigators, is invested. The lengthened filaments crowning the caput, joined anteriorly by the connecting membrane, and extending to the shoulders, would, viewed from a vessel's deck, present to the spectator the mane so accurately described as a singular feature in the gigantic specimen seen by Captain McQuhæ, R.N. and officers of H.M.S. "Dædalus." Then again, the rapidity with which that individual specimen moved through the water, would coincide with the capabilities of a member of this genus, for the motive power produced by such an extent of tail, coupled with the extremely compressed form of body from the head throughout, must be immense.

Here then we have a partial elucidation of the various statements which have at intervals appeared in the columns of the united presses of England and America, emanating from the pens of travellers, and usually headed—"Occurrence of the Great Sea Serpent,"—criticized, however, in an ungenerous manner, and always exposed to an unmerited ridicule at the hands of the many, but, nevertheless, firmly believed in by the few, who have patiently waited to see the day when the mystic cloud which has hitherto veiled the existence of the maned denizen of the deep should vanish with the suspicion of the sceptic, and exhibit more clearly the truth of the assertions of those ill-used men, who, endeavouring like useful members of society to extend the cause of natural knowledge by publishing candid accounts of what their eyes have seen, have always met with an amount of contempt and reproach, sufficient to silence for ever the pen of many a truthful writer.

I am sorry I have not the No. of the 'Illustrated London News' at hand in which Captain McQubæ's graphic statement appeared, as it would have afforded me an opportunity of particularising other features in connexion with his specimen and the present one. The facts, however, regarding the mane-like appendage, and the rapidity of motion to which I have alluded, are still fresh in my memory.

My best thanks are due to Mr. George Trimingham, the captor, for the generous manner in which he placed the fish at my disposal.

J. Mathew Jones.

Note on an Ophioid Fish lately taken in the Island of Bermuda, which appears to be new to Science. By Edward Newman, Memb. Imp. L. C. Acad.

I hope that zoologists will not consider me assuming the office of a teacher if I add a few memoranda on the family of fishes to which Mr. Jones' specimen belongs: if such should, however, unfortunately prove the case,—should my readers remind me that my editorial privileges scarcely extend to the right of appending notes to the productions of a much more able ichthyologist than myself,—I can only plead in mitigation that this family of fishes is one

> "In which my spirit doth take delight,"

from their evident approach to that much-abused sea serpent, in the existence of which I have ever entertained the most unwavering belief.

The family Cepolidæ or riband fishes is so named from the Cepola rubescens of Linneus, the red snake-fish of Couch, described in the fourteenth volume of the 'Linnean Transactions,' page 76, a small snake-like fish not uncommon off the coast of Cornwall, but of which the largest preserved specimen is less than twenty inches in length: the body is very long, thin, compressed laterally and riband-shaped, not cylindrical, like the body of a snake, and the dorsal, caudal and anal fins appear to combine in forming a continuous fringe of fin extending from behind the head to the extreme caudal extremity, and thence returning along the belly and reaching nearly to the throat.

Of this family six species, belonging to as many genera, have been found in the British seas: — 1, the red snake-fish (*Cepola rubescens*); 2, the Vaagmær or Deal-fish (*Trachypterus bogmarus*); 3, the silvery hair-tail (*Trichiurus lepturus*); 4, the scabbard-fish (*Lepidopus argyreus*); 5, Hawken's Gymnetrus (*Gymnetrus Hawkenii*); and 6, Banks' Gymnetrus (*Regalecus Banksii*), which I think identical with the Ophidium Glesne of Ascanius, in the 'Copenhagen Memoirs' for 1776, as also with the Gymnetrus Banksii of Cuvier and Valenciennes, 'Poissons,' tome x. p. 365; with the Regalecus Banksii of Richardson, in the 'Second Supplement to Yarrell's British Fishes'; and perhaps also with the Gymnetrus Grillii of Linroth, described in 1798.

Sir John Richardson seems to regard the genera Gymnetrus and Regalecus as identical, and gives the latter the preference on the ground of priority. Cuvier and Valenciennes, however, retain the more classically-derived word Gymnetrus, rejecting Regalecus, a Norse-latin compound signifying the "king of the herrings," on account of its barbarity. I think the views of these naturalists may be met by adopting both genera, treating the species Hawkenii as the type of Gymnetrus, and Banksii as the type of Regalecus, more especially as Sir John Richardson's characters of Regalecus, now immediately to be quoted, agree minutely with Banksii, but by no means with Hawkenii.

REGALECUS.—"Greatly compressed and elongated sword-shaped fishes. Teeth minute or none. Dorsal fin rising on the occiput like a plume. Caudal said to be continuous with the dorsal, and to embrace the point of the tail, but seldom seen entire, and of doubtful form in most species; ventrals uniradiate and very long, edged with membrane which expands at the end. Branchiostegals seven. A very long slender tapering stomach, of which three-fourths is cœcal; pancreatic cœca simple and very numerous. Scales microscopical in the nacry epidermis, also scattered osteoid tubercles on the skin."

A great number of individuals referrible to this genus have been taken at different times in the British seas, and I think it is commonly accepted that they constitute but a single species: of this, however, there is no means of judging with any degree of precision. All the specimens appear immature and all imperfect; they vary extremely in length, the shortest I recollect having been recorded in the 'Zoologist,' measuring twelve feet, and the longest twenty-four feet, and their fin-rays, as in the minnow fry, have not acquired that solidity which is the character of adult age. These juveniles clearly indicate the existence of some monster denizens of the deep which have not yet gladdened the eyes of the scientific. The best description of any individual specimen I have seen is that by Messrs. Hancock and Embleton, read before the Tyneside Naturalists' Club, and published in the 'Annals of Natural History' for July, 1849. The following abridged extracts from this description are reprinted from Sir John Richardson's 'Second Supplement to Yarrell's British Fishes,' a work in which will be found an admirable *resumé* of all that is known of these interesting fishes. The description cited was made from a specimen taken at Cullercoats on the 26th of March, 1849.

"The fish, though much injured and greatly faded, was fresh and had a uniform silvery gray colour, except a few irregular streaks and dark spots towards the fore part of the body, and these were remains of a bright iridescence about the pectoral fin and head, a blue tint predominating. The body is excessively compressed, like a double-edged sword-blade, its greatest thickness being below the middle, and the dorsal edge is sharper than the ventral one. The total length when the mouth is retracted is twelve feet three inches, and the depth immediately behind the gills eight inches and a half; two feet farther back the greatest depth of eleven inches and a quarter is attained, and at the end of the dorsal fin it has diminished to three. The skin is covered with a silvery matter in which the scales are invisible to the naked eye, but which is easily detached and adheres to anything it comes in contact with. Submitted to the microscope, this nacre was found to consist of scales like those on the wing of a moth. Round the hind border of the operculum there is a broad dusky patch; a crescentic dark mark exists above the eye, and there are eight or nine narrow oblique streaks on the side, which diminish to mere spots beyond the vent. The lateral line descends gradually from the suprascapula to within two inches of the ventral profile at the vent, and continues descending as it proceeds to the distal end of the fish. Four flattened ridges, each more than an inch in breadth, reach from the head to the tail above the lateral line, the longest and uppermost commencing near the eye. The skin is studded with numerous bony tubercles not regularly arranged, and in the neighbourhood of the head they are replaced by depressed indurations. On the ventral edge the tubercles are numerous and have hooked tips pointing towards the tail. The head is small, measuring only nine inches to the gill-opening; the orifice of the mouth is circular, and capable of being protruded two or three inches by the depression of the mandible: the tongue is small, smooth and prominent; there are no teeth, and the interior of the mouth is black. Gill-plates proportionally large; preoperculum crescentic, with the lower horn prolonged forwards to the articulation of the mandible; operculum curved elliptically posteriorly, ending obtusely. Branchiostegals seven. Branchial arches four, with tubercular bristly rakers. Pharyngeal bones above and below furnished with setaceous teeth. The dorsal fin extends from between the front of the orbits to within three inches of the distal extremity of the fish. The twelve anterior rays were stated by the captors to have been about fourteen inches long, and furnished with a membrane on their posterior edges, which grew wider upwards, somewhat like a peacock's feather. The ends were broken off, but a continuous membrane connected their bases, and their shafts appeared ragged with the remains of the torn membrane. In addition to these there were 268 other rays whose acute points overtopped the connecting membrane, or 280 dorsal rays in all. About the middle of the fish, where the dorsal rays are highest, excepting those on the head, they measure upwards of three inches and a half, and at the termination of the fin their height has increased to one inch. Behind the termination of the dorsal fin, the edge of the back slopes rapidly downwards to within an inch of the line of the belly, and then forms a rounded point, which is the distal extremity of the fish. Both the upper and under edges of this extremity are very thin, and the fishermen insisted that when they took the fish this part was entire, and that there was no tail-fin whatever. The edges may may be pressed together, and seem to fit. The pectorals are attached low, and contain eleven rays. The ventral fins were represented by a pair of very strong straight spines broken short to the length of four inches, but were said to have been originally twice that length, having even then broken ends; a membranous edge was visible at their bases. The vertebræ, judging from elevations obscurely seen through the muscles, were reckoned at 110. Fin-ray formula, D. 280, V. 1, P. 11, Vertebræ, 110 ?—*Hancock and Embleton l. c.*"

In the foregoing description are many points of similarity to Mr. Jones' fish, but still there are other points in which the two fishes are so decidedly dissimilar that I venture to consider them distinct, and to propose for the Bermudian fish the name of Regalecus Jonesii, as a well-merited tribute to the zeal and industry of the accomplished naturalist who has favoured me with the description. I am sure that naturalists will pardon the omission of specific characters, as I could only copy those which Mr. Jones has so admirably given in the preceding paper. The characters I shall notice are differential only.

REGALECUS JONESII, *Newman.*

In Regalecus Jonesii the flexile rays constituting the plume on the crown of the head, with the exception of the three anterior ones, are connected by membrane, and the three which are so connected have lanceolate points. In R. Banksii all these rays are connected by membrane: the first is clavate at the extremity, the second, third and fourth acute, and the seven following ones clavate. In Regalecus Jonesii there is a series of dorsal fins all along the back, the rays in each fin being connected by membrane, but the fins not being connected with each other. In Regalecus Banksii there is but one fin, and that is continuous from head to tail. In Regalecus Jonesii the ventrals have two consistent bony rays; in Regalecus Banksii they have but one. These differences, combined with the difference of habitat, Regalecus Jonesii in the North Atlantic Ocean and Regalecus Banksii in the German Ocean seem to render it apparent that the two species are perfectly and permanently distinct.

In reference to the last question mooted by Mr. Jones, the similarity of Regalecus Jonesii to Captain M'Quhæ's sea serpent, I do not consider myself competent to express an opinion. I am quite willing for the present to allow every sea serpent to hold on its own course; hereafter a better opportunity may be afforded on comparing and arranging the conflicting evidence already published in the 'Zoologist.'

EDWARD NEWMAN.

Occurrence of the Sea Bullhead at Montrose.—In the third edition of 'Yarrell's British Fishes,' recently published, mention is made of the discovery in Dingle Harbour of an example of Fabricius' sea bullhead (*Acanthocottus grœnlandicus*), and a figure and description of the species are given. A characteristic specimen of the same fish was taken two years ago in the basin of the South Esk, at Montrose, from a salmon-net, by William Beattie, Esq., Secretary to the Montrose Natural History and Antiquarian Society. The fish may therefore be considered as more than an accidental visitor of the British seas, and other examples will doubtless soon be found by the active and intelligent promoters of Natural-History museums in our sea-ports.—*John Richardson.*

Singular Account of the Sail Fluke (Zeugopterus velivolans).—Dr. Baikie, writing from the banks of the Niger, referred to by Dr. Alexander Duguid, of Kirkwall, for information respecting the very curious habits of this fish, and that gentleman, on being applied to, most kindly sent a sketch made by a friend of his, said to be very correct. He also furnished the following particulars of the history of the fish. This fluke, he says, is highly prized as an article of food, its flesh being firm and white. It does not take a bait, and he only once saw it caught in a net, but it comes ashore spontaneously, with its tail erected above the water, like a boat under sail, whence its name. This it does generally in calm weather, and on sandy shores, and the country people residing near such places train their dogs to catch it. The following letter was written by Mr. Robert Scarth, of North Ronaldshay, the northernmost island of the Orkney group, where the sail fluke is very common. "It is never caught by hook or by net, and I have in vain set ground lines for it in the South Bay, baited with lug-worms, limpets and sellocks, neither have flounder or skate nets drawn there inclosed a sail fluke. It seldom comes to the shore earlier than October or later than April, though it is often driven by storms on the beach, entangled among sea-weed. The great supply is, however, obtained in the following manner. In the winter and early spring a pair of black-headed gulls take possession of the Bay, drive away all interlopers, and may be seen at daybreak every morning beating from side to side on the wing, and never both in one place, except in the act of crossing as they pass. The sail fluke skims the ridge of the wave towards the shore with its tail raised over its back, and when the wave recedes is left on the sand, into which it burrows so suddenly and completely that though I have watched its approach, only once have I succeeded in finding its burrow. The gull, however, has a surer eye, and, casting like a hawk, pounces on the fluke, from which by one stroke of his bill it extracts the liver. If not disturbed the gull no sooner gorges this luscious morsel than it commences dragging the fish to some outlying rock, where he and his consort may discuss it at leisure. By robbing the black-backs I have had the house supplied daily with this excellent fish in weather during which no fishing-boat could put to sea. Close to the beach of South Bay a stone wall has been raised to shelter the crops from the sea spray. Behind this we posted a smart lad, who kept his eye on the soaring gulls. The moment one of the birds made its well-known swoop, the boy rushed to the sea-strand, shouting with all his might. He was usually in time to scare the gull away and secure the fluke, but in almost every case with its liver torn out. If the gull by chance succeeded in carrying his prey off to the rock, he and his partner set up a triumphant cackling, as if deriding the disappointed lad. Seals often pursue these flukes into the Bay, and frequently leave serviceable morsels unconsumed. The sail fluke exhibits its gambols most frequently before a storm, or when a thaw succeeds a frost. It is the most delicious fish of our seas, but loses its flavour by a day's keeping."—*Sir John Richardson, in 2nd Supplement to 'Yarrell's British Fishes,' February* 19, 1849.

[At present the talented describer of this new British fluke has not had the opportunity of examining a specimen, and does not appear to feel much confidence that the species is absolutely new to Science.—*E. N.*].

Note on Pyrgoma, a Parasitic Cirripede. — It is well known that Pyrgoma anglicum, a little sessile barnacle, is always found parasitically seated upon the margin of the corallum of certain Caryophylliacea. In my account of Caryophyllia Smithii ('Actinol. Brit.' p. 315), I have observed that "two are sometimes found on the same coral." But I have just been presented, through the kindness of Mrs. Thynne, of Regent's Park, with specimens of the corallum of this species, one of which is crowned with no fewer than nine, the other with eleven, of the little Pyrgomata. The appearance of the ovate barnacles, each with its orifice crowded all round the edge of the coral, is exceedingly curious and novel. — *P. H. Gosse; Torquay, March* 31, 1860.

*Observations on rearing Lepidopterous Larvæ.**

HAVING during the past season given a good deal of my spare time to rearing larvæ from the egg, I now venture to send you some notes of my proceedings, in the hope that—though they contain nothing wonderful or new—they may be of use to encourage other beginners to do something in the same way. Till lately I used to throw away in despair the eggs laid by captured moths, but this year I took an entirely opposite course, and kept every egg I could obtain, until, towards the end of summer, I was fairly beaten by numbers.

However, I have succeeded in bringing on to the state in which they should at present naturally be nearly sixty broods, varying in number of individuals from 3 to 3 × 30, and comprising more than forty species,—having let but one species of all that I took in hand slip through my fingers. The apparatus I have used is that recommended in the 'Entomologist's Annual' for 1855,—the flower-pot and glass cylinder,—and for a preparatory academy it answers admirably, giving to the juveniles light and security, and to their owner a much better opportunity of watching their forms and movements, whilst they are small and easily hidden, than any less open case can afford. It is also cheap; small flower-pots of course are not costly, and, as to glass cylinders, I use lamp-chimneys of old-fashioned forms, which the chandler was glad enough to get off his hands at a very low rate. When sand, in which to stick the food-plant, cannot be easily procured, fine earth will answer very well, and—if the remark be not thought too obvious—I may hint that, next to a growing plant, a young shoot on a bit of old wood or stem will last fresh longer than anything else; however, where possible, I always have (instead of leaves or twigs plucked off) a small growing plant, ready potted, before the larvæ are hatched. A little trouble spent in picking up, during one's rambles, seedling oaks, birches, thorns, or clean healthy plants of bedstraw, plantain, &c., will save one a great deal of after-trouble in changing food, as well as lessen the risk of injuring one's stock: a growing plant, if properly managed and proportioned to the number of mouths put upon it, will last good till most larvæ are big enough to be easily and safely removed to their finishing-cage: this may still be a flower-pot, larger of course than the first, and covered with leno, stretched (for the sake of more light and better ventilation) domewise over a couple of bent canes, the ends of which are stuck into the earth in the pot, and fastened with—not string—but an elastic band. Of course cages with glass sides would be best for continuing one's observations, but, where one has a number of species feeding at one time, a corresponding number of cages would entail a great expense. My nursery has, for the most part, been a room facing the East, the window being kept partially open night and day; a few things I put out of doors, not so much for their own health as that of the plants on which they were feeding, and which would have needed renewal oftener if kept in the house.

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* Reprinted from the 'Entomologist's Weekly Intelligencer.' The author is anonymous in the 'Intelligencer,' but I take on myself the responsibility of vouching for his statements, being well acquainted with his accuracy and veracity.—*Edward Newman.*

Perhaps I ought to say that my experience has been chiefly confined to Bombyces and Geometræ, and for these reasons:—I do not sugar, and I cannot induce the few Noctuæ that do fall into my hands to part with their eggs, whilst I find Geometræ to be, in this respect, almost as generous as Bombyces. A female moth shut up in a pill-box is almost sure to give you eggs, and if a sprig of the proper food be put in with her she will deposit them on that; you have then, on noticing a change in their colour, only to place sprig and all on the growing plant, and the larvæ will walk on to their pasture, without your having to hunt them about with a feather or camel's-hair pencil, neither of which perhaps feels quite so soft to their skins as it does to our own. When the food is unknown I think it is best to allow the larvæ to be hatched in the pill-box, and then give them their choice by putting in small bits of six or seven different things, such as oak, sallow, birch, bedstraw, chickweed and dandelion (the food of allied species in some degree guiding one's selection); in a few hours, except perhaps in the case of some aristocrats who are squeamishly select, sundry little holes and notches will appear in the object of their choice, and their owner's feverish anxiety may begin to subside. It is a guess of mine that most of the unknown larvæ feed on low plants, for were they to be found on shrubs or trees they would have been dislodged thence before now by some energetic collector.

Below is a list of the species about which I have at present any remarks to offer; but, before I stop my pen, I wish to be allowed—as a "mere collector"—to give a shove to the movement now on foot, towards giving us improved descriptions.

While some species seem fixed to one type, for others it is not enough to describe,—not to say a *single* larva,—but any number of individuals, if belonging to the same brood; and in others again locality appears to cause a good deal of variation; hence probably arises the inaccuracy to be seen in descriptions which come to us stamped with the authority of great names. On the other hand, notes made by detached entomologists on single species sometimes fail in defining what they intend from want of more extended knowledge in the writers, for much of the value of a description depends on its being made with an eye to allied species. For instance, in a great many loopers, one finds the following pattern prevail:—a row of six dorsal markings from fifth to tenth segment (the four middle ones being best defined and coloured, and the first and last more indistinct), running into continuous parallel lines on the front segments, and contracting into a line, or being repeated with fainter outlines and more stunted proportions, on the hinder segments; and it is easy to understand how, where the colouring is not very different, a curtailed description of one species may be made to suit two or three others.

But here I had better stop, and say no more than that I for one should be very glad if any one, competent to do so, would publish a few hints on word-painting as applied to larvæ, giving perhaps some headings, under which the different parts of the description might come; future discoveries might, in that case, be more satisfactorily chronicled than the two or three unfortunate "unknowns" upon whom I have "tried my 'prentice hand."

O.* *Smerinthus Tiliæ.* All the pupæ which produced the parent moths were dug at elms, yet the larvæ fed up twice as fast on lime as on elm. What makes the larvæ of large species so apt to sicken and die off, apparently without cause? All three species of Smerinthus, as well as Cerura vinula, have served me in this way, whilst I have reared brood after brood of small things without losing a single larva.

Chærocampa Elpenor. This year I was introduced for the first time to the green variety of this larva—a much handsomer fellow than his dingy brother. I noticed that a pupa in one of my cages worked itself out of its loose cocoon, and lay quite bare on the moss for six or seven weeks before the appearance of the perfect insect. This can hardly be its habit naturally?

Cossus ligniperda. The following dates seem to confirm the notion that the time passed in the larva state is two years: October 29, 1857, I found in an oak tree several larvæ an inch and a quarter long, but, despairing of being able to keep them alive, I left them where they were; September 22, 1858, I visited the same tree, and found, in exactly the same part of it, several larvæ nearly full grown, being (as I suppose) the same I had seen in a juvenile stage eleven months before: I now boxed six or seven, kept them in sawdust through the winter, and on examining their cage some time last spring found the cocoons contained pupæ. Again, early in August, 1859, I found in the same tree some little larvæ about three quarters of an inch long—just big enough to have been hatched six or seven weeks previously, and to grow in a month or two to the size of those I found in October, 1857.

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* O. prefixed to the name of a species indicates that it has been bred from the egg.

O. *Dicranura vinula.* Three larvæ, which I succeeded in rearing out of a small family of six, differed from the figures and descriptions I have seen in having on the eighth segment, the dark dorsal stripe running down in an elongated patch far below the spiracles, though not enclosing either of them, to the middle of the second proleg; and on the ninth a smaller and more irregular patch formed by an offshoot from the white border of the dorsal stripe, and enclosing two dark spots. Another larva, captured when just about to spin, gave me an opportunity of admiring the 'cuteness of some pirate of an ichneumon; she had arranged from fifteen to twenty eggs in little irregular rows in the folds between the third, fourth, fifth and sixth segments, just where poor "Puss" could not touch them, and where they were completely hidden when it contracted itself in fear or repose; so well were they hidden that it was with very geeat difficulty that I succeeded, after many attempts, in picking them off with a pair of pincers. These eggs were black, and the little white maggots in them had just begun to poke out their heads, ready to begin operations as soon as their victim should have thatched them in for the winter.

Notodonta camelina. A pupa dug in the winter did not produce the moth till late in July, though, in the same box, Drymonia dodonæa and Peridea trepida came out on May 14th, 15th and 16th. A larva, taken from a hazel-bush, assumed a pale lilac tint at its last moult, with a darker dorsal line of the same colour.

O. *Cilix spinula.* This funny little larva seems to be very stationary during the first half of its life, eating away the upper skin only of the hawthorn-leaf on which it is located, and accumulating a little heap of frass, something like that to be seen in the mines of some of the Micros.

Nonagria Typhæ. The pupæ occurred in vast numbers this summer in some railway cuttings in my neighbourhood; in fact, it was hard to find a plant of Typha not tenanted by one of them. It appears to me that the larvæ — unless they leave the leaf-stem in which they have been feeding to spin up in an old mace-stem—make their cocoon in their mine just below the point where the flags begin to spread apart from one another; by cutting out, therefore, seven or eight inches of the flag-stem at this part the pupæ may be collected rapidly and safely, without the trouble or risk of opening the flags to see where they are; and by being kept in their cocoons they are preserved from the danger of drying up: I lost but three out of twenty-four; that is, only one in eight—a very small proportion.

Agrotis Ripæ. From twenty to thirty larvæ, collected on sand-hills in September, 1858, I bred on the 10th of June, 1859, a single Agrotis, which proved to be a fine dark variety of this species. Why the rest died is a puzzle, for they were kept out of doors in a large pot full of sand, and fed on growing plants of hound's tongue, the food on which they were found; however, as A. valligera and A. Tritici, though captured in May and kept in sand, and fed on growing plants, lose three-fourths of their numbers before the perfect insects appear in August and September, I suppose this dying off is a family failing. The larva from which A. Ripæ came may be thus described:—Ground-colour very variable, from a light pea-green to a yellowish gray (one larva I noticed, which, like Richard the Second's fops, rejoiced in being green for half his length and gray the other half); dorsal line a deep tint of the ground-colour, enclosing a very thin light line; three fine waved subdorsal lines, not quite so dark as the dorsal, and placed close together just above the spiracles; spiracles black, and placed in a band rather darker than the ground-colour; spots dark and shining; head and plate of second segment pale brown. I think some of these larvæ hybernate in the sand at a depth of several inches; they give over feeding by the end of October.

Dianthæcia carpophaga. This larva, which those who have gardens can feed on the seeds of rose campion (*Lychnis Cœli-rosa?*), has swarmed this summer; one could not a pick a dozen flowers of Silene inflata without finding their traces, and from one little patch I shook out scores of them, mixed with D. Cucubali, D. capsincola and Eupithecia venosata.

Dianthæcia Cucubali. Must be partially double-brooded; I bred the perfect insect in June, 1859, from larvæ taken in September, 1858, and again on the 24th of July, from larvæ taken on the 6th of the same month. The larva certainly does not from choice eat the seeds of the Silene when ripe and hard, but descends to feed on the leaves, and may be found hidden under the plant, and not, like its allies, in the capsules.

Angerona prunaria. Three or four larvæ, beaten from hazel and mountain-ash, were for a time a great puzzle: their colour agreed pretty well with the descriptions of this species, but the dorsal humps did not; especially that on the ninth segment, instead of being merely bifid, was adorned with two long slender horns—curved backwards, and this made me fancy they might belong to the next species.

O. *Pericallia syringaria.* These larvæ, which I have now hybernating small, on privet, are most wonderful creatures; afflicted from their birth with a most dreadful rheumatism or curvature of the spine, whether eating, resting or moving, they preserve (as far as my observation goes) pretty much the position represented by Hübner's figure, copied in Plate 60 of Humphrey and Westwood. Other tree-feeding loopers amuse themselves during their younger days by swinging at the end of silken cords, stiff and straight as pokers; P. syringaria swings; but still keeps its nose and heels in close contact, thus combining something of the amusement of the low-feeders, who love to twist themselves into notes of interrogation, figures of 2 and capital Qs.

Amphydasis betularia. I have seen three or four specimens of the green variety of this larva, all of which had a pink dorsal line, and the humps and spiracles of an orange colour.

O. *Hemerophila abruptaria.* Undoubtedly double-brooded! From eggs laid in May I bred the perfect insect in August! Perhaps it would be as well to mention that at the time these later moths appeared some of the produce of the very same batch of eggs were still feeding as larvæ, though hatched at the same time and treated in exactly the same way as their precocious brethren, one of whom awaits with them the coming of next spring in the pupa state: I noticed that the slow feeders attained a much greater size than the fast ones, and expect to breed larger moths from them. When first hatched these larvæ have a beautiful purple stripe on the back, but they soon lose it.

O. *Acidalia imitaria.* Two or three loopers hatched from I know not what eggs in August, 1858, produced A. imitaria on the 1st of July, 1859. They fed on groundsel, and though at last they grew to a great length they were more than ten months about it. Having kept them out-doors, and so out of sight, I forgot to make a description till they had begun to spin, so I cannot speak as precisely as I could wish;

however, I know they were exceedingly long and thin, of an ochreous-gray ground-colour, and streaked and clouded with a little dusky black at the segmental divisions and along the sides.

O. *Bradyepetes amataria.* A brood, hatched on the 7th of July, fed away so rapidly for about a fortnight on dock, that I hoped to see the moths appear in August; however, upon attaining about two-fifths of their full-size they suddenly ceased eating, and are now hybernating in most obstinate abstinence. I took the perfect insect again outdoors on the 11th of August.

O. *Corycia temerata.* I mention this species only to notice the neat way in which the female laid her eggs along the ribs on the under side of the sloe-leaf, which I gave her, instead of scattering them all over it, as many moths would do.

O. *Larentia olivata.* As some of the summer species indulge sometimes in an autumn brood, so I am half-inclined to suspect does L. olivata appear before its usual time in August; at all events I took it in good condition this summer at the end of May or beginning of June; but perhaps this has been, on account of the great heat, an exceptional season. Larvæ, hatched on the 30th of August, are now hybernating small on Galium Mollugo. As far as I can see at present they much resemble the next species, both in habits and appearance, having been red when first hatched, and since become very much wrinkled and dingy-coloured.

O. *L. pectinitaria.* That this larva is not so well known as the abundance of the perfect insect would lead one to expect need not be wondered at: it is such a sluggish creature, and so fond of hiding at the roots of its food, that I should think scarcely any one who has not taken the trouble to breed it can have seen it: some I had given me by a friend, who has helped me in the following description, would remain motionless, as if dead, for hours; in fact, I never once saw them move, though I watched them often. When first hatched they are bright red, but soon become dingy; when full-grown they are short, stout and wrinkled, with small black tubercles emitting bristles; ground-colour a dingy olive-brown, with a dark interrupted dorsal line, from the fifth to the tenth segment a row of reddish V-like marks, having the angle towards the head, and the side lines reaching almost to the spiracles; from the tenth segment to the tail is a broad stone-coloured stripe; subdorsal line light and wavy; belly fawn-colour, with dark patches above the feet. Will eat Galium mollugo, and has also been reared on G. saxatile.

O. *Eupithecia pumilata.* After two or three unsuccessful attempts to rear this species on Convolvulus Sepium and C. arvensis, I luckily tried a brood with Clematis flowers, on which they throve wonderfully; they must, however, eat other things, as the moth appears throughout nearly half the year; one was brought me from the lamps on the 22nd of November, evidently just fresh from the pupa. The larva when first hatched is bright orange, with a dark head, and the very smallest creature in the shape of a Maskel—not belonging to a Micro—that I am acquainted with.

O. *Melanthia ocellata.* This larva is remarkable for having the dorsal markings repeated on the belly, though with this difference—that the six Vs on the back are formed with whitish lines, and have the angle pointing towards the tail, while the ventral Vs are red and point towards the head.

O. *Melanippe procellata.* This larva is the largest of the genus, and very difficult indeed to describe. In figure it is long, and tapers towards the head; ground-colour pale yellowish brown, paler in the last four segments; dorsal line black, interrupted at the segmental divisions from the fourth to the tenth with a reddish dash followed by a black dot, and terminating at the tail in a dark spot; subdorsal lines dingy brown and rather diffuse, almost touching the dorsal line on the middle segments, but receding again at the segmental divisions, and thus leaving a pale space around the black dots they become lighter on the posterior segments; there are two or three brownish wavy lateral lines, becoming more clouded from the sixth to the ninth segment, where they quite run into one another, but after that become at once paler and thinner; spiracles black in a white ring; there is a dark dash above each leg. Some larvæ are much darker than others, and have all the lines quite black and much clouded, so as to allow very little of the ground-colour to appear. The brood I had were hatched on the 22nd of August, full grown in a month, and fed on young shoots of the garden Clematis.

O. *M. unangulata.* Of this species I have seen five or six broods, and have so far found the larva not to vary very much. In shape it tapers slightly towards the head: the ground is of a pale stone-colour; there is no regular dorsal line, but a series of dusky dashes and dots, and at the five middle segmental divions these dots become enlarged and quite black in colour, and are preceded by an oblong transverse reddish mark, and that again by a square white spot; there are two very wavy and diffused subdorsal lines of a very faint dusky black, but just above the spiracles is a pretty clear thin line of the ground-colour, followed by another of the darker tint; the spiracles are black; the belly of the ground-colour, only more yellowish, and marked on each side at the five middle segmental divisions with little groups of fine black dashes and dots. It thrives well on chickweed (*Alsine media*), being full fed in somewhat less than a month. Whether the moth appears again out-of-doors in the autumn I cannot say, but I bred two or three in my flower-pot about the 20th of August, in the same way autumnal specimens of M. rivata and Anticlea rubidata have been bred in-doors, though I have never seen them on the wing out-of-doors at that time.

O. *M. fluctuata*. One day in July I found, together with six or seven of the (to me common) brown and gray variety of this larva, one that was quite green all over, but with sufficient indications of the dorsal pattern to make me think it was of the same species, as in time it proved to be; I mentioned the circumstance to one of our great men, and was informed that he had never seen any but green larvæ of M. fluctuata; this set me breeding all I could, but out of six or seven broods — certainly not large ones — I succeeded in obtaining but one green larva, which on passing its last moult appeared with a dorsal line of two tints of red, but grew gradually less brilliant, until just before spinning it showed no red at all.

O. *Camptogramma fluviata*. The following dates may prove of interest: a female laid me a batch of eggs on the 27th of July, from which I bred the moths from the 1st to the 10th of September; all their transformations having been passed in an average time of forty days. On the 22nd of August I procured eggs from another female, the moths from which appeared from the 8th to the 11th of October, having thus taken on an average seven or eight days more than the former brood to go through their changes. Since then I have been told of a brood hatched in October, which passed six weeks in the larva state alone, and from which at the time I am writing (December 9th) no perfect insects have yet appeared; also of another brood of larvæ, hatched in November, which are still very small, and feeding but slowly. Most of the captured specimens of the moth itself that have come under my notice have occurred near low ground, but I cannot think it an exclusively marsh insect, for both the egg-laying females and the larvæ (next season I hope to be able to give the proper name of the food-plant) have been found on the sides of hills, at a considerable elevation above any water. Some of the females have on the fore-wings a dash along the costa, three or four waved strigæ, and the ring round the dark spot — all of the ground-colour of the male's wings and some of the latter have a grayish ring round the central spot; the dark central band in both sexes is liable to be interrupted, and indeed to be much diminished in extent every way, sometimes appearing as two thin irregular dashes or streaks.

O. *Cidaria picata.* I have found this larva almost a tougher subject for description than Melanippe procellata, but must try my best: the ground is of a pale stone-colour, segmental divisions reddish; no dorsal line, but a dark blackish patch on each segment, increasing in size and depth of tint up to the ninth, where it attains its maximum, none on the last four segments; subdorsal stripes dusky, very much freckled and diffused, and forming four small dark dots at the corners of the dorsal patches; just above the spiracles is an irregular dusky stripe enclosing a thin wavy line of the ground-colour, bordered with black; spiracles black; belly marked on each side at the segmental divisions with groups of small black spots. Thrives fast on chickweed, though I must confess I half expected to find it attack the leaves of some tree or shrub.

O. *C. corylata.* Two or three larvæ, hatched on the 22nd of June, fed up on the small-leafed sloe, and went to earth on the 2nd of October, having grown so very slowly that for a long time I fancied—especially as they did not appear at all unhealthy—that they would hybernate. They did not quite agree with the descriptions I have read, but had the ground-colour of a yellowish green; subdorsal stripe greenish yellow; on the third to the fifth segment, and again on the eleventh to the tail a dark reddish brown dorsal stripe; on each of the intermediate segments four very fine brown dots arranged in pairs, with a fine dash on each segment and at each segmental division; spiracles white, the middle ones having between them a row of four brown spots; belly sprinkled with very fine brown dots arranged in lines.

C. pyraliata. A rather slender pale green looper, with yellowish segmental divisions, and a broad dark green dorsal line, bordered on each side with yellow, which I found in spring feeding on cleavers (*Galium Aparine*) produced this species, and I know it has also been both reared and taken on Galium mollugo. Query, Is Albin, as quoted by the 'Manual,' right in giving whitethorn as the food? though I suppose it is certain that Eupithecia vulgata feeds on flowers of ragwort, &c., as well as on hawthorn.

O. *Eubolia cervinata.* A small batch of eggs, laid October 14, 1858, and kept together through the winter, were hatched at various intervals between April 10th and May 30th, 1859, some of the larvæ having been six months and others seven months and a half in the egg; however, the perfect insect did not show so much variation in the time of their appearing.

Eupithecia expallidata bred from the Golden-rod, &c.—It may interest Mr. M'Lachlan to know that three years since I bred seven specimens of Eupithecia expallidata from mixed larvæ beaten from Solidago virgaurea, Senecio Jacobæa and Achillæa millefolium. I have little doubt that the first-named flower is the ordinary food-plant. Last autumn I again met with what I believe to be the larva, and took accurate descriptions, which, should my suspicion prove correct, I hope, ere long, to give the readers of the 'Zoologist.'—*H. Harpur Crewe; Wickham Market, Suffolk, March* 31, 1860.

Description of the Larva and Pupa of Sarrothripa Revayana.—I have bred this from a dark green larva, with long very fine white hairs. It has but little or no resemblance to any Tortrix larva with which I am acquainted. The pupa is bright green, with a broad black line down the centre of the back; it spun a white silken cocoon between two leaves of oak upon which the larva fed.—*William Machin; 35, William Street, Globe Fields, Mile End, March* 26, 1860.

A List of Micro-Lepidoptera, of which the Transformations are unknown. By CHARLES MILLER, Esq.

THE following list I had prepared for my own use, but it having occurred to me that it might prove useful to my fellow entomologists in the coming campaign I am induced to publish it for their benefit, through the medium of the 'Zoologist.'

It will be observed that beside those species of which the transformations are entirely unknown I have included those of which the habits are as yet imperfectly worked out, and also those which have been discovered in the larva state on the Continent, but not yet noticed in the same stage here. With regard to these latter species, I have introduced them because it may possibly happen that their food in this country is not the same as that which they affect abroad.

I have also accompanied most of the species with a few remarks, the result of my own experience with them. Meagre though such scraps of information be, they may nevertheless prove useful in confirmation, and taken in conjunction with the observation of others.

A slight glance at the list will immediately suggest that much remains to be done before the veil of obscurity which hangs over the habits of these species can be removed.

It is very evident that we have got through the easiest part of our task in investigating the habits of the Micro-Lepidoptera, and that the elucidation of the remainder will be proportionably difficult. As an example of what has been accomplished we may refer to the four very natural genera — Coleophora, Elachista, Lithocolletis and Nepticula. In investigating the transformations of these we have positive information respecting part of the species which we can safely apply in our researches into the economy of the rest, and our labours are rendered comparatively light. Thus we know that a Coleophora larva is a case-bearer, and feeds on the seeds and leaves of plants, making conspicuous blotches on the latter; that an Elachista mines long white galleries in the leaves of grasses; that a Lithocolletis feeds on the parenchyma of the leaves of trees and shrubs, contracting the cuticle in a manner peculiar to itself; and that a Nepticula makes a long narrow contorted mine; and accordingly we are guided by such information in our search. But there are many genera of which we know little or nothing concerning their habits, and that little is calculated to lead us astray rather than aid us, and many again are so rare that we can make only the most remote guesses at their economy. Others there are which feed in decayed wood, and present us with no sign by which we may recognise their presence, and some, as with the genus Gelechia, feed in every conceivable manner, and make a similarity of habit the exception instead of the rule.

These are some of the difficulties which we must be prepared to encounter at every step, and therefore I think that all information, however slight it may appear, is worthy of being recorded, as it may at some time or other serve to form a connecting link in our chain of knowledge.

Talæporia pubicornis.

Diplodoma marginepunctella. The larvæ of this species are occasionally met with on old palings, and have been found to have a carnivorous propensity. Whether this is their usual mode of feeding or whether they are in reality lichen-feeders is not thoroughly decided. Perhaps they like a change of diet.

Ochsenheimeria bisontella. Judging from analogy one would suppose this species, like O. Birdella, would feed in the stems of grass, but in the spot where I am accustomed to take it commonly the only grass to be found is the mat grass (*Nardus stricta*). It may feed in this, but the hard roots seem scarcely suitable for a tender Micro-Lepidopterous larva. I recently examined a large quantity of this plant but found no trace of larvæ.

Tinea imella.

T. ferruginella. I have beaten the perfect insect out of hedges, and Mr. Scott found it plentifully in a coal mine: the larvæ probably feed both in rotten wood and Fungi.

T. Monachella, T. picarella, T. ruricolella, T. cochylidella, T. albipunctella, T. merdella, T. flavescentella, T. simplicella, T. subammanella.

Lampronia Luzella. Can this feed in the shoots of bramble?

Incurvaria tenuicornis.

Nemophora Schwarziella. Now that we know the habits of one of the species (Swammerdamella) we should not have much difficulty in working out the history of the remainder. No doubt they feed in cases on low-growing plants, and should be searched for in open places in woods where the imago occurs. I once found N. Metaxella plentiful in a clearing, flying at dusk a short distance from the ground; the prevailing herbage was primroses and wild strawberries. They should be feeding at the present time.

Adela rufimitrella. It is evidently the habit of the larva of this and the preceding genus to winter in the larva state in cases, and complete their feeding in the early spring. Both in this and the following genus the female has a very elongated abdomen, well suited for penetrating the corolla of a flower, and it will no doubt be found that they lay their eggs at the bottom, that the young larva when hatched makes its way into the seeds, and feeding there until it has attained a certain growth quits its temporary abode, and constructing a case feeds upon low growing plants through the summer and autumn, winters and completes its feeding in the spring. On the Continent the larva of this species has been found in cases under fallen leaves. I have taken all my specimens in the perfect state on the flowers of the Erysimum alliaria. It is generally supposed to be attached to the Cardamine pratensis.

A. Sulzella. This I have also taken from the blossoms of the Erysimum. Can it have a similar habit to the preceding species?

A. viridella. This is one of our "difficulties." The insect is generally common, but yet eludes all our endeavours to discover its economy; its habit of flying round the branches of oaks may possibly have nothing to do with its mode of feeding, yet Mr. Stainton has observed the females apparently in the act of laying their eggs on the midribs of oak leaves.

A. cuprella. Our knowledge of the habits of this species is very scanty: we know that it frequents the catkins of blooming sallows, but these are most attractive to insects generally, and whether the young larvæ feed therein is a point which time will decide.

Nemotois scabiosella. With so close a natural connection between this and the preceding genus we may reasonably suppose a similarity of habit in the preparatory stages. N. scabiosella has been observed lying with expanded wings on the blossoms of the Scabiosa columbaria, her abdomen thrust among the florets as if performing the operation of laying her eggs.

N. cupriacellus. I have found on the same plant, and also obtained by sweeping amongst papilionaceous flowers.

N. fasciellus. Though exceedingly partial to the blossoms of the elder, I have taken them from the flowers of the thistle. I have also taken them apparently at rest on the leaves of elder and nettles.

N. minimellus. I have also obtained by sweeping amongst papilionaceous flowers.

Micropteryx calthella, M. aruncella, M. Seppella, M. mansuetella, M. allionella, M. Thunbergella, M. purpurella, M. salopiella, M. semipurpurella, M. unimaculella, M. Sparmannella and M. subpurpurella. We are still quite in the dark as to the mode of feeding of the species composing this genus. True M. unimaculella has been bred from pupæ found in small mines in the lichen and bark of birches, but more than this nothing is known. Some of the smaller species frequent flowers; thus, M. calthella is common on the blossoms of the Ranunculaceæ, M. Seppella as abundant on the Veronica Chamædrys. All are early in their appearance, and as the eggs must be deposited in the spring, and they are but single brooded, it would appear that these little creatures take a year to perfect their transformations. Can they be larvæ for so long a period, and where do they exist; in the stems and leaves of the plants they affect?

Swammerdamia lutarea.

Chalybe pyrausta.

Eidophasia Messingiella.

Plutella annulatella. Probably feeds on one of the Cruciferæ, like the other species of the genus.

Cerostoma sequella. Reputed to feed on lime and sallow, in May and June.

C. alpella. Occurs in the perfect state amongst oaks and hornbeams.

Exæretia Allisella. Supposed to frequent the Artemisia vulgaris in the perfect state. The larvæ should be looked for in May and June.

Depressaria bipunctosa.

D. ciniflonella. Can this feed in the shoots of fir trees?

D. Yeatiana.

D. granulosella. I once bred a specimen of this from larvæ collected in July, at Deal, from a dwarf umbelliferous flower.

D. Douglasella. Has been bred from one of the Umbelliferæ, but wants further investigation.

D. badiella.

D. pastinacella. Whence the name of this species? One would suppose it to feed on the Pastinaca sativa.

Gelechia cinerella, G. inornatella.

G. gerronella. This has a singular partiality for the common fern. The larvæ should be looked for in May and June.

G. vilella.

G. nigra. This should feed on the white poplar in May.

G. fumatella.

G. ericetella. A common species amongst heather.

G. divisella, G. palustrella.

G. peliella. Feeds on the Continent on Rumex acetosella.

G. longicornis.

G. terrella. Another of our difficulties. The insect swarms on every common and in every piece of waste ground, and yet the larva remains unknown. Mr. Douglas found several Gelechia-like larvæ in March, amongst moss, whilst searching for beetles; these were supposed to be the long sought for G. terrella, but none were reared, and Mr. Scott found it in a breeding-cage which contained a bunch of rushes.

G. desertella, G. politella.

G. senectella. This is another common species amongst fern. The larva should feed in May and June.

G. mundella. Has been bred from moss, but the larva not proved to have fed thereon.

G. boreella, G. galbanella, G. basaltinella, G. humeralis, G. Æthiops, G. distinctella, G. solutella, G. celerella, G. maculiferella, G. junctella, G. vicinella, G. Hübneri, G. littorella, G. aleella, G. albiceps.

G. tenebrella. Bred from moss, but the larva not observed.

G. tenebrosella, G. Sircomella, G. immaculatella, G. nigritella, G. atrella, G. suffusella, G. lucidella, G. lutulentella, G. gemmella, G. subdecurtella.

Parasia neuropterella. Most likely feeds in the seeds of one of the Compositæ, in conformity with the habit of the other species of the genus.

Cleodora cytisella. The perfect insect always occurs amongst fern. It has been suggested that as C. striatella feeds in the stems of the tansy, this may also affect the Pteris aquilina in a like manner.

Chelaria Hubnerella. Said to frequent poplars in the perfect state. I have never noticed this habit, but have met with it commonly amongst birch and hornbeam.

Aplota palpella. A continental species has been bred from rotten wood; this may have a similar habit.

Sophronia parenthesella. Occurs amongst broom. Can it be an internal feeder?

Pleurota bicostella. A common species on heaths. The food-plant of the larva is a mystery.

Harpella Geoffrella. From the habits of the other species of the genus we may safely conjecture that this feeds in decayed wood.

Hypercallia Christiernana. Feeds on the Continent on Polygala Chamæbuxus: this is not a British plant, but it has its representative in another species, P. vulgaris. The insect is so rare here that it would well repay us to find the larva. It should be searched for in May.

Dasycera Oliviella. The larva no doubt feeds in decayed oaks, which trees the perfect insects frequent.

Œcophora tripuncta. Supposed to frequent brambles.

Œ. Woodiella. Very scarce, and nothing as to its habits known.

Œ. grandis. Has been taken in hedges "composed of living and dead hazel and birch," in which most probably the larvæ feed.

Œ. formosella. Another rarity, and we may have to wait long before its transformations are discovered.

Œ. lunaris, Œ. lambdella, Œ. subaquilea, Œ. Panzerella, Œ. tinctella, Œ. fuscescens. Like most of the genus these are no doubt decayed wood feeders.

Œcogenia quadripuncta.

Butalis fusco-cuprea, B. cicadella, B. variella, B. incongruella. All the larvæ have probably the same habit, namely, that of living in webs upon their food-plant.

Atemelia torquatella.

Pancalia Leuwenhoekella, P. Latreillella. As a rule those species of the Tineina which feed internally are more or less brightly coloured. Wood feeders are brilliant in their markings, but destitute of the spots and bands of gold that distinguish the miners in leaves. Now as the latter characteristic is abundantly presented by the two species of this genus, we may reasonably conjecture that they inhabit the interior of leaves in the larva state. P. Leuwenhoekella is a very early insect; I have taken it on the 22nd of April. I have fancied it attached to the rock rose. Singular it is that wherever I take the species there is the Helianthemum. Most probably it feeds up in the autumn, but as the above plant is almost an evergreen it might be worth while searching for the larvæ now.

Acrolepia perlepidella, A. betulella.

Röslerstammia Erxlebella. Frequents heather and lime trees in the perfect state, and reported to feed on the same, but the point wants further elucidation.

R. pronubella.

Glyphipteryx fuscoviridella, G. Thrasonella, G. cladiella, G. oculatella, G. Fischeriella. The first of these is a common insect in damp places on heaths, flying amongst the short grass. G. Thrasonella partial to rushes, perhaps feeds in the stems. G. Fischeriella frequents blossoms indiscriminately, and affords us no clew to its habits.

Æchmia dentella.

Tinagma sericiellum, T. stanneellum. Both species seem attached to the oak, and the larvæ no doubt have a similar habit to T. resplendellum.

Argyresthia semitestacella, A. spiniella, A. semifusca.

A. retinella. In the shoots of birches in May and June?

A. abdominalis. In the shoots of juniper in May and June?

A. Andereggiella. In the shoots of wild apple in May and June?

A. præcocella. In the shoots of Juniper?

Zelleria hepariella. Bred by Mr. Stainton, but the larva not observed.

Z. insignipennella, Z. fasciapennella.

Gracilaria stramineella, G. hemidactylella, G. falconipennella, G. imperialella.

Coriscium sulphurellum.

Ornix devoniella.

Coleophora olivaceella.

C. orbitella. Has been bred from a case found on the stem of a birch tree, but whether the larvæ fed on the leaves of the same remains to be proved

Coleophora deauratella, C. Fabriciella, C. vulnerariæ, C. niveicostella, C. apicella, C. squamosella.

Stathmopoda pedella.

Cosmopteryx Lienigiella.

Batrachedra pinicolella.

Chauliodus insecurellus. Probably feeds on one of the Umbelliferæ.

Laverna Stephensi, L. decorella, L. subbistrigella, L. rhamniella.

Chrysoclista bimaculella.

C. flavicaput. I have an idea that this feeds in decayed hawthorn stumps.

Asychna modestella. Another difficulty. A very abundant insect where it occurs, on the flowers of the stitchwort, but like some other species this habit may have nothing to do with the food of the larva. It is difficult, however, to disconnect the plant and insect one from another. It is also supposed to frequent oaks.

Elachista apicipunctella, E. flavicomella, E. Holdenella, E. stabilella, E. humilis, E. consortella, E. obliquella, E. cingillella, E. serricornis, E. collitella, E. dispunctella, E. ochreella. These are all most probably grass feeders, and a few seasons will no doubt put us in possession of their complete history.

Lithocolletis nigrescentella, L. triguttella, L. scopariella, L. ulicicolella. Four species of which very little is known; the two first are unique. L. scopariella is supposed to feed on the broom, and Mr. Stainton suggests April and May as the feeding-time of the larvæ.

Opostega salaciella, O. auritella, O. crepusculella, O. spatulella. All the species frequent damp places amongst grass. O. salaciella I have found repeatedly after the usual time of flight sitting on broom twigs.

Nepticula intimella, N. headleyella, N. apicella, N. sericopeza, N. quinquella. Time and perseverance will work out the history of these entomological atoms.

Trifurcula atrifrontella, T. squamosella, T. immundella. I have an indistinct remembrance of noticing a mine similar to that of T. pulverosella in the leaves of broom. This may be T. immundella.

Bohemannia quadrimaculella.

Charles Miller.

March 14, 1860.

Notes on the more common Species of the Genus Bombus.

By Col. H. W. Newman.

Bombus subterraneus. The female is nearly ten lines in length; the male between six and seven lines; and the worker nearly six lines, but varies very much in size. This bee is very numerous throughout England and Scotland: it builds its nest deeper than any other of the genus, generally a foot to eighteen inches under ground, and, on this account, is difficult to get åt. I mistook this bee for the Bombus Hortorum for some years, until I became better acquainted with it. It is to be found in meadows, especially among drains and in banks. The number of individuals in one nest varies from ten to fifty, but is generally between ten and thirty only. The male is very like the worker, except in being more uniform in size, in having longer antennæ, and in being more hairy towards the anus, and the abdomen not so sharp pointed. This was the first bee of the genus in which I discovered the freaks of the drones. The males of this species fly very near the ground, and with a short dodging flight. On fine days, after leaving the nest, they amuse themselves in flying from place to place at short distances, paying visits to tufts of grass, to holes in the ground, to banks, ditches, walls, &c., and these rounds of visits are continued to the same spots on warm days for several hours, that is, between 9 A. M. and 2 P. M. I mentioned these movements to my friend Mr. W. H. L. Wallcott, of Clifton, who imagines these males have never been mated with the young queens. Males, females and workers fly near the ground, and the males have a more unsteady flight than the workers. I have both watched and taken many nests of this bee, and have never seen a male return to the nest, nor do the males make any observations when leaving the nest, as is the case with the worker. This species is not pugnacious or irritable; I have never been attacked by them when taking their combs; indeed, bees of this genus only become irascible in proportion to their numbers. Bombus subterraneus prefers the larger flowers, such as the foxglove, dead nettle, snapdragon, and other similar sized flowers. It is very late before the queens make their appearance in the spring. The males may be seen in great numbers, in September in a dormant state, on the common thistle blossoms in cool showery weather.

I have never found the black cuckoo bee (*Apathus rupestris*); I have taken the nests of this bee, but the queens of this species are generally infested with Acari, which attach themselves to the body of the bee, about the junction of the thorax and abdomen. This bee shows great instinct in its search after honey: in those blossoms which it cannot reach inside it goes to the bottom of the flower outside and penetrates the part where the nectary lies.

Bombus lapidarius (redtailed bee). This is not only a large and very handsome species, but is one of the most interesting of the genus. It makes its nest in old walls, heaps of stones, and dry stony banks. At Aberystwith I found a nest on the top of the hill to the left as you face the sea; it was nearly two feet from the surface of the ground to the combs, and contained about two hundred and eighty workers, and the combs contained about fifty males and twenty females unhatched. I have never seen any of the males of this species re-enter the nests; they make their appearance much later than many of their congeners, but are easily distinguished from the workers by their beautiful gay liveries of buff and red—a little in the parroquet style of ornament. Generally speaking they seldom give much trouble in digging out when in the ground, being near the surface; the nest at Aberystwith was therefore unlike any other of this species I ever saw. The workers are not very pugnacious so far as I have found them, but are extremely active in gathering honey. The flight of these bees is very steady, and at a moderate distance from the ground. The males go their rounds in fine weather, and are to be found frequenting the smaller thistles, Veronica, &c.

B. Derhamellus. This bee is so like B. lapidarius that it is mistaken by many for that species, but the discerning eye of the illustrious Ray pointed out the difference many years ago. It builds its nest in meadows and pastures, the grassy parts of lawns of gentlemen's houses, and is in this respect like the moss carder (*B. Muscorum*). The flight is much higher in this species than in the moss carder. I have taken many of their nests. In August, 1857, I captured a whole nest on one of the little knolls near the sea at Llandudno, N. Wales. The workers were very pugnacious, more so than ever I saw them; the heat at the time was 82° Fahr. in the shade. The male of the B. Derhamellus is quite different in appearance from that of the B. lapidarius, being quite black, except the tail, and like the worker, but males and workers are at once to be distinguished by the difference of the antennæ. Although I have observed the Bombi in Scotland a good deal, when visiting that country, yet I never saw either the B. Derhamellus or B. lapidarius in any part of that country. I have taken several nests in that country of bees which inhabit walls, generally old ones, but, although they have a red tail, the yellow band on the collar and black body evidently mark them as a different species from either of those I have been describing.

B. Hortorum. This species is very common, but generally in small communities, numbering from ten to fifty. It is very similar to B. subterraneus, especially the females. Their flight is of the same dodging jerking order as the latter bee, but their nests are generally near the bottoms and lower parts of old garden walls: the great Linneus has given them the right name; indeed all the Bombi have been admirably named by that great naturalist, in allusion to their habits. The nests of B. Hortorum are seldom far under ground; the few that I have met in the open garden walks are not more than six inches, and they are very apt to be destroyed by the field mice. I have had two nests in different gardens, but never noticed any males issue from them. They fly near the ground like B. subterraneus, but on the whole are not so interesting as several of the others. They abound all over the kingdom. I have had less experience in handling these than any of the others enumerated by me; if the males even return once to the nest a desertion by these soon takes place: I have never watched this species so intently as I have the others, and cannot say positively as to the exact habits of the males, but presume they seldom or never return to the nest after leaving it.

B. Muscorum (moss carder, moss builder, and in Scotland, foggy). This is a most common species, building in the moss generally at a short distance from the tread of cattle, in hedge banks, &c.; the colour is a dark tawny yellow. The female is one of the latest in making her appearance in the spring, and as she prefers the larger blossoms of dead nettle, snapdragon, foxglove, and all the later wood flowers, it seems wisely ordered that her appearance should be late. I have had a great many nests of this species, and can testify that their sting is about the sharpest of any of the whole genus; this species flies near the ground; the males are a slight degree lighter in their colour. They fly low, and may be seen going their rounds in July and August, stopping at various places in the embankments, and proceeding onwards in fine weather. The individuals of this species are subject to be easily destroyed by vermin, hedgehogs, foxes, and last, though not least, by idle boys, as the nests are easily got at. My mode of capture is as follows: I remove the whole nest, bees and all, with the help of a knife or small spade, and then return it to its place; I revisit the spot after sunset and remove the nest to a box, and so capture them all. I had many nests at various times in my gardens; they work very actively for some time; I have known them do so vigorously until the middle or end of October under straw hives. The bees and combs should have some moss placed round them. Each of the nests contains from ten to one hundred bees. I have seen them in the moors in Scotland, about the middle of August, with one old queen and only four or five workers. The moss carders are the most hardy of all the English wild bees; they will brave the wind and rain in very tempestuous weather without being benumbed as most of the other species are.

B. terrestris. The workers of this species vary exceedingly in size; some of them are very small. The males generally appear about the third week in July; the females make their appearance very early in March. This bee is extremely like its congener, B. Lucorum, in colour and appearance, and has nearly the same flight; but the males of B. terrestris are very like the workers, with a slight difference in the antennæ and the lower part of the abdomen. I dug out a nest of these insects on the tram-road on the Gloucester Road, near Cheltenham, the middle of July, 1859, containing about three hundred workers, and the combs contained about fifty males and a few queens unhatched. They worked from a box in my garden for about six weeks; a good many young queens were hatched and worked well, but the males that hatched were extremely weak, most of them unable to fly, and the few which did fly never returned to the box. The passage to the combs from the entrance of the original nest was about three feet, and the combs were about eight inches or a foot from the surface of the ground. The workers were extremely irascible and acted offensively when near the combs, fastening occasionally on my clothes, in my hair, &c. This is the only species of Bombus, the nest of which I have ever found inhabited by the great black cuckoo bee, Apathus rupestris. This species is extremely fond of the lime blossom; in a showery summer, when these blossoms are out, I have seen these bees remain on them till long after sunset, and many of them, about the end of June or beginning of July, lying dormant under these trees on the ground, as if inebriated. I have taken hundreds of their nests containing a good deal of wild honey, in different parts of England and in Scotland. The males have the same habits as those of B. Lucorum, but I never found any bee, either male or female, of the latter species, in the nest of B. terrestris. These bees are also very fond of the Dutch clover (*Trifolium repens*), and Mr. Huish denounces them as great enemies of the hive bees in consequence, but he was not aware how few of the genus interfered in their pasture with the hive bee. The difference I have always found between the flight of the males and workers when removed to a new place is this, that on letting the captives out in the morning the males never make any observation on the new locality, but fly straight away instantly, whereas the workers come out with great caution, taking great notice of the entrance to the nest, and going farther and farther gradually from the place; this is done until they become quite acquainted with the locality.

B. Lucorum. The males of this species appear about the second week in July; the females make their appearance early in March. These bees build their nest about six inches to a foot under ground. This species is very numerous all over Great Britain; their nests are found in dry places, small woods and hedge banks; the flight of the queens is very steady, and the workers on issuing out of their nests generally ascend from thirty to forty feet in the air. This species is very numerous in July and August, often amounting to three hundred workmen and from fifty to sixty males besides the queens. They are not nearly so irascible as B. terrestris; I have taken nests of B. Lucorum very often without receiving more than one or two stings on my hand. The males are different in appearance from the workers, being nearly all over a deep buff colour, and the antennæ are a little longer as usual, but not so straight as those of the worker. I have captured hundreds of their nests, and watched them for many hours; I never saw one male return into the nests after leaving. Their flight is remarkably steady and high in the air. They are my greatest favourites of all the Bombi. There is a great similarity between these and B. terrestris both in the queens and workers, with a little more white at the tip of the abdomen, but the males are very unlike. This species is by far the most docile of about seven or eight which I have removed to my garden at various times during the last fifty years. The males amuse themselves on fine days for several hours in going their round of haunts, but different from those of B. subterraneus, as the former never fly very near the ground, but pass through hedges, bushes, shrubs and and low trees, keeping to the same places exactly in every round. This species is greatly infested with small Acari, which destroy the queens; they seldom remain during winter in the old nest, but in this there may be an exception to the general rule, for in a most populous nest which I took in Scotland, I found, in a compartment near the new combs, the remains of about three hundred more cells entire, but covered with mould, and evidently the combs of the previous year. I noticed these bees one mild autumn busy as late as the 9th of November on some flowers in my garden; they were small workers and not queens. I have also noted this bee as the earliest to commence nidification. On the 16th of April, 1856, I observed a female issuing from a bank of the Basingstoke Canal, Aldershott, and the next day and for several following days I saw the bee return to the nest, and, on its going out, it remained generally from twenty minutes to half an hour. No workers made their appearance for six weeks. The males of this species may be found frequenting the blossoms of Salvia, Veronica, &c., from the middle of July until the beginning of September.

I have heard from a friend who lives in Lower Canada that the Bombi in that country are numerous and much more irascible than in England, probably owing to the high temperature in summer, the thermometer in June, July and August, being often at 95° in the shade for weeks together at mid-day.

The strong instinct in all these interesting insects in choosing a place for nidification is displayed in always pitching on a spot which has a natural drainage from the wet. Many of their nests are to be found on the banks of canals, rivers, dry banks in hedge rows, and even those in meadows or pastures have generally a hole or drain near the combs which prevents their nests being inundated by any sudden gush of water, or they are situated in an extremely dry and elevated spot.

H. W. Newman.

Hillside, Cheltenham.
March 29, 1860.

[It is greatly to be wished that our correspondent, who appears to have so much leisure for studying the habits of these most interesting insects, had turned his attention to making out the exact connexion between the Bombi and Apathi which reside in the same nests. In October, 1834, then a child in Entomology, I thus defined this connexion, hoping my observations would lead others to a more minute investigation; but alas! how small is the increase of our knowledge in the twenty-six years that have passed away. "Larva hatched from an egg deposited by its parent in the nests of other bees at the time when their own eggs are laid; when it hatches, being larger and stronger than the rightful possessor of the cell, it consumes the food provided for its companion, and starves it to death; and in those instances in which fresh supplies of food are daily provided, it continues to receive and appropriate them as its own. Pupa changes in the same situation, in a silken cocoon, spun by the larva. The imago has no apparatus, either on the body or legs, for collecting honey; it enters the nests of other bees with perfect familiarity, and seems to be quite unsuspected of intrusion; it collects no pollen or honey; never builds a nest of any kind, or takes any care of its young; but spends its time among flowers, or hovering about sand-banks in which other bees have fixed their habitations." Mr. Smith, in his valuable work, has objected to my assertion, that the larva of Apathus is larger and stronger than its victim, but looking at the relative size of the perfect insects, I think probabilities are in my favour. With this single exception, I believe, the entire paragraph has remained for twenty-six years both uncomfirmed and uncontradicted.—*Edward Newman*].

The Hybernation of Wasps.—Mr. Wailes' statement respecting the queen Vespa vulgaris, found near the summit of Skiddaw is very interesting (Zool. 6941), and I think partly explained by Mr. Westwood; my solution of the matter is thus: in some seasons we often see an extraordinary number of queen wasps about the end of April, and yet in the after part of the summer very few nests, and a great—and I may say a pleasing—scarcity of workers. My opinion is that should a fortnight of wet cold weather arrive after their first appearance, many of these queens that have scarcely begun their nests, ake refuge for a time in the places alluded to by Mr. Wailes, and from the continuance of rain and cold become so benumbed that they never revive, and these are the queens which are found in hiding-places. I take great notice of the Hymenoptera; and in 1849, the appearance of the queen-wasp (and also the Bombi) in March and April was that of a most plentiful brood of these insects: but having afterwards twenty-five days of rainy weather in May, the nests in Gloucestershire have rarely been so few. I believe that two-thirds of the queen wasps which had begun or intended to begin their nests that year, perished in the month of May, as described by Mr. Wailes. Nevertheless, it is generally in a plentiful year of wall-fruit, plums and pears, that wasps are most common.—*H. W. Newman; Hillside, Cheltenham, April* 4, 1860.

British Hemiptera: a few words on them not in Scientific Language.

By Edward Newman, Memb. Imp. L.-C. Acad.

For the first time during a lengthened entomological career I hear a rumour of the British Hemiptera coming into favour. Messrs. Douglas and Scott promise us a list, or a catalogue, or some preliminary work, that is to act as a precursor to a knowledge of these hitherto neglected insects; and no sooner have we this announcement than we learn that Mr. Walker is already engaged in a similar labour. I believe that no one in England possesses a knowledge of the Hemiptera anything approaching to Mr. Walker's knowledge; and I think I may add that Messrs. Douglas and Scott do not pretend to any such knowledge, but have simply taken up the subject because no one else seemed inclined to do so. But although both these projects are now before our little entomological public, let no one suppose there will be two works on Hemiptera competing for public favour; I apprehend that the two projects will either merge in one, or that the second, should there be two, will be simply a revised, enlarged and improved edition of the first. This last is the better course: let one mark out the ground, the others erect the building; above all things let us proceed, as Mr. Doubleday has done with the Lepidoptera, and ascertain what has been done on the continent of Europe.

But while negociations are pending, and without any idea of the views which either of our friends entertain of the methodical arrangement of these said Hemiptera, or, in common parlance, bugs, I beg to invite the attention of my younger readers to a simple mode of classification. All the Hemiptera may be divided by very simple and natural characters into four principal groups, from which I totally exclude the Aphides, and the curious genus Aleyrodes, which is not allied in any way by metamorphosis with the other Hemiptera, and also the still more extraordinary family of Thripsidæ, comprising those mischievous little insects which nibble the purple petals of our Fuchsias, and entirely spoil their appearance. These and a few more odds and ends, together with one half of what I shall presently call the "short horns," are generally associated together under the name of Homoptera. For this droll association no entomologist has clearly explained the the reason, and should my young readers try to comprehend it I promise them they will not succeed.

The first thing to observe in a Hemipterous insect is the character of the antennæ; if they are long, jointed, capable of motion, and very plainly to be seen, the insect belongs to the division which I propose to call "long horns," but if they are very short, without apparent joints, incapable of motion, and very difficult to find out, then the insect belongs to the division which I shall call "short horns:" this kind of antenna may be called the ball and bristle antenna; it generally consists of one small round joint, and one very fine, small, short, bristle sticking out of it; neither the ball nor the bristle are to be seen without a magnifying glass, and the insects really look as though they had no antennæ at all, because their antennæ are almost entirely concealed in a groove or cavity close to the eyes.

Next we will divide the "long horns:" some run about the trees and shrubs and herbs, and feed principally, but not entirely, on the sap of plants, and others run on the surface of water, and feed on minute insects. The first I propose to call "plant bugs," the second "water walkers." The "plant bugs" are really and certainly the true bugs, Cimicina, and to this group properly belongs the bed bug (*Acanthia lectularia*), which I believe in its native country is a plant or timber-sucking insect; but, transplanted into a London atmosphere, it forsakes that cooling diet, and ceases entirely to be a vegetarian. Almost every one of these "plant bugs" emits a scent that is peculiar rather than agreeable; but the "water walkers," or Hydrometrina, have no such scent,—at least I have never discovered that they offend the olfactory organs.

The "short horns." offer an equally intelligible division into water and land insects; the water insects live actually *in* the water, and not *on* it, diving, swimming, walking and really living under water; they feed on insects, and some of them seize on a drowning fly with such intense eagerness that they will allow themselves to be dragged out of water rather than forego their meal. They are called "water boatmen" or Notonectina, which swim, and "water scorpions" or Nepina, which crawl. The land Hemiptera with short horns are called "frog-hoppers" or Cicadina, and, like the land "long horns," they feed on the sap of plants.

In collecting Hemiptera we must associate them differently, calling them "plant bugs" and water bugs;" the first and fourth divisions now come together, and the second and third divisions come together. There is no way of getting the "plant bugs" so readily as with a walking stick and umbrella; they are almost invariably found on plants, and the best plants to search are junipers, yews, larch firs, oaks and birch: spread the umbrella, turn it upside down, hold it under the boughs, and beat or shake until the insects fall in.

Now there is no racing or flying, the "long-horned plant bugs" crawl slowly and sedately up the silk or gingham, and make no attempt to escape the fingers of the entomologist as he picks them off one at a time and transfers them to his bottle of bruised laurel leaves, an indispensable implement of the bug hunter. The "short horns" require different tactics; they possess a leaping apparatus in the hind legs, which renders it very difficult to secure them; the better way, when you have one of them in your umbrella, is to close it partially, and the "frog-hopper" will, by a series of angry but ineffectual leaps, soon get to the bottom, where he will be secured without any difficulty.

When once in the laurel-bottle your captures are quite safe: the fumes of prussic acid appear to have no painful effect whatever on the imprisoned insects; they walk about with apparent unconcern, after the first minute or two exhibiting a little weakness of the joints, and at the end of five or six minutes turning on their backs and ceasing to move. This, however, is only a temporary stupor or torpor, or coma, as mesmerists would call it, for I have known them entirely wake up, recover, and attend to the ordinary occupations of life, even after passing twenty minutes in this comatose state therefore

I venture strongly to recommend that they remain in the laurel-bottle at least two days.

On taking the bugs out of the bottles there is a choice of two ways of preparing them for the cabinet, pinning or carding; mine are ancient specimens, and when they were caught I followed the ancient practice of pinning, but younger and better entomologists than myself invariably card their bugs. In case of pinning, the pin should be passed through the very centre of the scutellum, not on one side, as in beetles. Whether pinned or carded, the legs and antennæ should be neatly displayed, and two or three individuals should be set with their wings wide open, so as to exhibit their characters, and to expose the dorsal surface of the abdomen, which is often gaily coloured: two or three individuals also should be laid on their backs to exhibit the colour and form of the under side. These instructions will appear trifling to experts in the Science, but all beginners will be glad of any attempt to direct their proceedings aright.

The water walkers, water scorpions and water boatmen require different treatment. A water-net must be provided which is constructed on this plan: an iron hoop, ten inches in diameter, is screwed to the end of a strong but light bamboo-cane, and on this hoop is fastened a bag-net, which of course is ten inches across at the mouth, and tapers gradually to the bottom a depth of eighteen or twenty inches: this bag-net is made of cheese-cloth, a fabric that has two excellent properties; *first*, it is so strong that tearing is out of the question; and, *secondly*, it allows the water to pass through freely. This implement may be used wherever there is water; in rivers, canals, ponds or ditches; especially at the sides where there are weeds growing in the water; for these weeds always abound with insect life, and you will invariably be more puzzled with the multitude of captures than disappointed by want of success. A great number of beetles inhabit water; the carnivorous and the herbivorous beetles have both a large aquatic section, and some of these you will infallibly find in every haul. But I am now only talking of Hemiptera. I always provide myself, when on these fishing excursions, with two or more wide-mouthed vials half-full of whiskey; and, as soon as the water has strained off, I go down on hands and knees, and pick out the insects, popping them, one by one, into the vial. All the water Hemiptera are carnivorous, and desperately savage when handled; the water boatmen especially will instantly make a dig at your fingers with their sharp beaks; often have they made my blood flow very freely. But you soon get into the way of avoiding their bites by a little skill in the handling; and the whiskey soon prevails over their propensity to fight with and damage their fellow-captives. If put into the bottle alive, and without spirits, they are quite sure to injure each other.

These water Hemiptera may be kept in the spirits almost as long as you like, and when perfectly convenient you may take them out at any time, and after soaking them thoroughly in hot water, dry them on blotting-paper, and either pin them or card them just as you please. The cards to use for this purpose are called "printers' large extra;" the best cost about 8*d.* a pack, and one pack will probably last through the season. Different opinions prevail as to the size and shape of the cards; some entomologists prefer the cards all of one size, others all of one shape. I think questions of this kind are scarcely worth considering, but as Nature has introduced a great variety in the shape and size of her beautiful creations, so there can be nothing very improper in allotting to each individual an allowance of card somewhat in proportion to his bulk. Gum is an article that requires more care, and the best is made by mixing equal quantities of the most pure and colourless gum trajacanth and gum arabic, adding a small portion of corrosive sublimate.

But there is no objection to take home the captured Hemiptera in a perfectly wakeful state. If you intend doing this, provide yourself with a wide-mouthed vial and put in it a few strips of blotting-paper: drop the insects when caught into the vial, corking it after each is imprisoned. When arrived at home fill a small white basin with boiling water, uncork the vial over it and let the prisoners fall in; if any remain in the vial, give the bottle a sharp tap and they will fall into the water: death follows instantaneously and without a struggle. Dip them out with a tea-spoon and lay them on blotting-paper. While the paper is absorbing the water, prepare the cards, gum-water, &c., for setting them out; you will find the limbs pliable and ready to take any position in which you wish to place them. Mr. Douglas tells me he prefers this hot-water mode of killing Hemiptera, but I have sometimes thought that hot water destroys the brighter colours.

EDWARD NEWMAN.

Monograph of Tenthredinidæ much wanted.—I wish some entomologist would take upon him to monograph our Tenthredinidæ, as Mr. Smith has done the bees and Fossores; it is a work much wanted. At present this family appears in the utmost confusion, no one venturing to give an opinion for fear he might not be correct. Perhaps Mr. Smith would be good enough to take up this next-of-kin to his favourites the Aculeata, as I am sure his pen and pencil would do us an infinite service by so doing.—*E. Parfitt; Museum, Taunton, February* 4, 1860.

Description of a new Species of Hemerobius.—The following is a description of a species I took here last autumn:—

HEMEROBIUS HAGENII, *Mihi.*

H. Testaceo-flavescens. Antennis fusco-annulatis. Oculis nigris; femoribus et tibiis pallidis; tarsisque rufescentibus. Alis hyalinis, punctis fuscis sparsis; stigmatibus aurantiacis.

Long. corp. 2 lin. Exp. alar. 6½ lin.

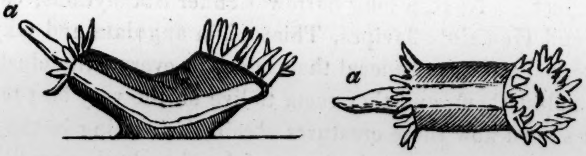
Pale testaceous. Eyes black. Antennæ pale yellowish, rather short and thick, annulated to the tip with dark testaceous rings. Wings pale testaceous-yellow; the nervures slightly darker and dotted with brown; a few larger blotches of the same colour towards the apex of the wing; stigmata forming a bright orange blotch, very conspicuous. Posterior wings paler than the anterior, and without the brown dots, but having a bright orange blotch on the anterior margin, corresponding with the stigmata of the anterior wings. All the wings beautifully iridescent. Legs pale yellow; the ungues dark ferruginous.—*Id.*

Ants' Nests and their Inhabitants.—When I was in the habit of visiting Rannoch and similar places in the far North,—where these things grow wonderfully large,—their investigation for beetles was not then so fashionable as it is now, or I might possibly have swelled the present list; in short I did not know that there was such a *lapis mir(e)*abilis underneath them, and the consequence was, my search only extended to the procuring the larvæ of Cetonia ænea. The Germans, I believe, were the first to risk themselves in a colony of this kind, and to proclaim to the entomological world the wonders they had met with. Their antecedents soon procured hands as bold amongst us, and, thanks to their exertions, our lists soon showed the good they had done. I confess it is rather a startling thing to come upon an ant's nest, about six feet in diameter by say eighteen inches in height, literally covered with a heaving blacklead-coloured mass, making a continual little crackling noise; after having examined them attentively for a little while, you next naturally begin to look at the ground on which you are standing, and also to look all around you, and you see that although these ants are not so crowded as on the nest, yet they are there by hundreds, and that during the short time you have stood watching them many have found an opportunity of examining the watch-chain at your waistcoat-pocket; and others—with a more hidden meaning—have crawled up the legs of your trowsers: the reasons for their doing so you will find by-and-bye. But to the ants. There is no hope of obtaining the beetles, except by plunging through that living mass and lifting away a portion of the nest, and so you must first spread a sheet of good strong brown paper on the ground; it is preferable to cloth, because the ants are not so easily detached from the latter. Next, lift off the ants with both your hands from that part of the nest you are going to carry away to your paper; and now, as though the place had been set fire to, you see thousands of little streams poured forth to extinguish it. This is the formic acid they are discharging in self-defence, and with which they seem to be liberally supplied. The position they assume to enable them to do it is a very droll one. They stand upon the back of the abdomen supported with their third pair of legs: this brings the anus, from which it is discharged, so that the stream ascends in nearly a perpendicular direction. Should it by chance get into the eyes it causes extreme pain, and it makes a sensible hot feeling wherever it touches the face, as though blistering it: it tastes like very strong vinegar and smells very like blacking. Having lifted as much as you can conveniently do with both hands (it is bad policy to take too much at once), drop it on your paper and let it lie for a few minutes that the ants may wander out of it, and in the meantime you can be cutting a small branch from some neighbouring fir-tree, to serve as a brush to brush away the ants which have and are wandering over the parts of your paper uncovered by the piece of nest. After you have cleared the bulk of them off, remove your paper to a distance from the nest, and then proceed to investigate the contents, which you must "persuade" into a heap at one end. Then with a piece of stick or a knife-blade draw it down on to the body of the paper, a little at a time, and watch carefully. That little pitch-coloured shiny thing, about one-eighth of an inch long, is Saprinus piceus—hence its specific name; you will see it move presently. That larger black thing, not quite so shiny, is Dendrophilus pygmæus, and that dirty cinnamon-coloured piece of rotten twig you fancied had life in it, from its falling over just now, is no other than one of the Monotomas, of which there are two species to be met with, namely, M. angusticollis and M. conicicollis. Then the Staphylinidæ have many members which luxuriate in this sort of life, Quedius brevis being the largest representative. Next in length is a Xantholinus (ochraceus), a fellow you find folded up in the most uncomfortable position you could conceive it possible for an insect to take. Fancy your finger with another joint to it and bent up towards the palm of your hand — as you can do without closing the hand — and the extreme joint folded underneath the one next to it, and this will give you some idea of it. Well, this is its position, and so it lies there. I am, however, not certain that it is peculiarly an ant's-nest species, although it seems common there. Then there is Dinarda Mäerckelii, easily known from its flat, broad appearance across the shoulders, and having reddish elytra. It is very active, and takes precedence of all the others in this respect. Next, a long narrow slender Staphylinus, called Leptacinus Formicetorum, and Homalota flavipes, Thiasophila angulata and Oxypoda formiceticola, may be observed trying to conceal themselves in every little cluster of the *débris.* The ants never molest them, and they seem to live on the very best terms. No one, I believe, has ever shown how these creatures obtain their living in the nests; probably the greater part of them prey upon the larvæ of Acari and other small insects infesting the nests, and which may be hatched there for some wise purpose, or brought by the ants themselves on the small pieces of fir-leaves and bits of sticks. They are for ever buzzing about. The whole of the before-named species of Coleoptera are to be found in the nest of a single species of ant (Formica rufa) and many others are also known to be tenants of the same myrmecophilous pile. I have, however, confined myself to those species which within the last few days have fallen to my lot, and at another time I may probably return to the subject with a fresh batch of claimants for notice.—*John Scott ; 13, Torrington Villas, Lee, S. E., April* 16, 1860.

Actinia Mesembryanthemum with Three Mouths.—I have now in my possession an Actinia Mesembryanthemum with three distinct mouths; it is only within the last fortnight that I detected the third mouth, although I have had the specimen for some months, during which it seemed to be merely a double-disked individual. Having often examined it at different periods, without noticing any sign of a third mouth, I can hardly resist the conviction that it has been developed within a short time of its detection. Double-disked examples of this species do not appear to be very uncommon. One specimen I observed last year while expanded in its native pool, but usually they have turned up among specimens taken at random: they have only occurred to me of small size and of the greenish varieties. The triple-disked individual is less than a small pea and of a pale olive-green colour, the margin of each mouth being of a deeper blue-green. One double-disked specimen apparently developed itself in one of my pans of sea-water. Having cut out the body of a limpet for microscopic purposes, I dropped the empty shell into the pan for the hermit-crabs, &c., to regale themselves on whatever might remain attached to it. After several weeks a minute specimen of Actinia Mesembryanthemum was noticed attached to the inner side of the shell, where it could not have been during the life of the mollusk, and on close examination it was seen to be double-disked. It is remarkable that none of this species of Actinia were in the pan, nor had there been any for two or three months previously.—*George Guyon ; Ventnor, Isle of Wight, April* 4, 1860.

PS.—It strikes me that in my communication a few days ago, regarding double-disked Actiniæ, I termed one of my specimens a triple-disked individual; if so I made use of a phrase not exactly correct, as, although it possesses three mouths, two of them are placed on the same disk without any intervening row of tentacles; at the same time there is a tendency to such a separation, as a single rather large tentacle stands well out from the rest on one side, marking where the division should be.

DOUBLE-DISKED ACTINIA.



Side view. View from above.

a. a. Strip of Meat.

PS. 2.—Since my last communication I presented a long strip of meat to one of the mouths of a double-disked Actinia; it was of course drawn in, and in a few hours the Anemone had extended itself to take in as much as possible, a portion still projecting from the mouth. The opposite end of the meat was just inside the rim of the other disk, further than which it could not go. The next morning the food had been digested, and was being at the same time rejected by both the mouths, showing, if proof were needed, that they led to the same stomach.—*Id.*

Proceedings of Societies.

ENTOMOLOGICAL SOCIETY.

April 2, 1860.—J. W DOUGLAS, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Zoologist' for April; presented by the Editor. 'The Proceedings of the Zoological Society of London,' 1859, Part 3; by the Society. 'Journal of the Proceedings of the Linnean Society,' Supplement to Vol. iv. Botany; by the Society. 'Exotic Butterflies,' Part 34; by W. W. Saunders, Esq. 'The Journal of the Society of Arts' for March; by the Editor. 'The Literary Gazette' for March; by the Editor.

Elections.

Dr. E. Candeze, of Liege, Belgium, was elected a Member; and George Seaton, Esq., of Trinity Square, Brixton, and J. C. Young, Esq., of Redwood House, Bromley, were elected Subscribers to the Society.

Exhibitions.

The President exhibited some specimens of a species of Trogoderma, which had bred in great numbers in rice imported from Akyab, about two years since, and now at Hibernia Wharf, London Bridge; he also exhibited a quantity of the damaged rice in which, he was informed, the larva had increased to a great extent within the last nine months.

Mr. Stevens exhibited some splendid Lepidoptera sent from Batchian by Mr. Wallace, amongst which were beautiful examples of both sexes of Ornithoptera Crœsus, Papilio Orumnus, P. Deiphobus, P. Codrus, and a fine new species allied to P. Peranthus; also a small Hestia, very distinct from any described species.

Mr. Lewis exhibited a damaged example of Telephorus atra, *Linn.*, a species not hitherto recorded as a native of Britain; the specimen exhibited had been taken in Scotland by Mr. John Scott, and determined by Mr. F. Smith and himself, by comparison with continental examples in the British Museum collection.

Mr. Janson exhibited some Coleoptera taken at Rannoch by Mr. C. Turner.

Mr. Westwood observed, with reference to the large species of Bruchus, exhibited at the last December meeting by Dr. Wallace, as infesting the interior of the nest of the Coquilla (Attalea funifera of Brazil), that there appeared from an investigation which he had made with a view to the determination of the species in question, to be considerable confusion in the nomenclature of the species allied to Bruchus Bactris of Linnæus. That name had been given to a species which infests an American palm of the genus Bactris, and which had been first figured by Jacquin in his 'History of Select American Plants,' pl. 170. According to Schönherr, this species of the allied Bruchus Nucleorum of Fabricius are at once distinguished by having the intermediate joints of the antennæ marked on the upper side with a deep oblong impression. It may, however, probably be questioned whether in the absence of specimens reared from the same species of palm, there is sufficient ground for the distinct identification of the Linnean species. In the 'Proceedings of the Entomological Society,' September 4th, 1854, some seeds of the wax palm of the Brazils, Copernicia cerifera, were exhibited, together with the beetles reared from them. These were purchased by Mr. Westwood at the sale of the Society's exotic collection, and are now in the Hopeian Museum at Oxford. The beetles agreed with Gyllenhall's diagnosis of Bruchus Bactris in Schönherr (i. p. 93).

Latreille's Bruchus curvipes (described and figured by Humboldt, Obs. de Zoologie, p. 158) was obtained from the fruit of a palm near Serullo, in New Spain. It has longer black antennæ, with entire joints. Germar's Bruchus ruficornis infests cocoa nuts brought to Europe, — the fruit, apparently of a species of Bactris (probably Bruchus minor); it differs from Latreille's species in having red fore legs and antennæ, but is given as synonymous with it by Schönherr, without, as appears, sufficient cause.

Sir William Hooker had forwarded to Mr. Westwood a larva of one of these large species of Bruchi found in the interior of a seed of a palm (a species of Astrocaryum from Bahia) which had been received at the Royal Gardens, Kew: the larva differed in no respect from that of the Coquilla nut. Mr. Westwood had also obtained the nut of another kind of palm, in the interior of which was found a perfect beetle, which seems in no respect to differ from Bruchus ruficornis of Germar. Mr. Kirby also possessed a specimen of a large and closely-allied Bruchus, evidently obtained, from its not fully-developed state, from the interior of some nut, also purchased by Mr. Westwood, but having much larger and more strongly-serrated posterior femora. A specimen of the Coquilla-nut beetle itself is preserved in spirits in the Christ Church Museum, Oxford, in company with the nut and its larva. It also seems to agree with Bruchus ruficornis, so as to preclude the necessity of giving it a distinct specific name, until a more detailed examination of the allied species can be made. The species allied to Bruchus ruficornis are distinguished from Bruchus Bactris, not only in the smooth intermediate joints of the antennæ, but also in having the sutural stria of the elytra simple at its base; in the latter species it is accompanied at the base by two very short rows of punctures like an acute V.—*E. S.*

NOTICES OF NEW BOOKS.

DAY after day I regret the way in which these notices have fallen into arrear; but how unavailing is regret! Let me, however, call attention to the extracts, which number after number of the 'Zoologist' contains: these are the cream of the zoological literature of our period; and exhibit our progress in its most favorable light. Henceforward, however, I propose to notice in each successive number, every new publication that reaches my hands, and to combine this with an attempt to get up the arrears.

'*A Sketch of the Natural History of Brighton and its Vicinity.*' By Mrs MERRIFIELD. Brighton: W. Pearce, 5, Bartholemews, 1860. Post 8vo., 227 pp.

Although most desirous for the success of this unassuming volume, and desirous also of giving full credit to the amiable authoress and her assistants, I cannot truthfully conceal the fact that, like all local "Natural Histories," it reveals the amount of knowledge possessed by the compilers, rather than exhibits the natural products of the locality described. Thus we find, in insects, there are nine and a half closely-printed pages of the names of Lepidoptera; while of Diptera there are two pages only, and of Orthoptera and Hemiptera there is no name at all. Wherefore this disparity? It is because the Lepidoptera have been well studied, the Diptera little studied, and the Orthoptera and Hemiptera not studied at all. Because Mr. Henry Cooke has so long and ably worked at the Lepidoptera, there is a very full list of species, and because, as the authoress fairly states, "Of the Orthoptera and Hemiptera I have not been able to procure any local lists." No one works at Orthoptera and Hemiptera. Every other section of the volume in the same manner indicates with precision the amount of labour and knowledge brought to bear on that particular section. The botanical lists are contributed by Mr. Mitten, and are really excellent; and Chapter VIII., on the Botany of the South Downs, will be found most useful to the visitor in search of our native plants.

'*The Natural History of the Tineina.*' Volume IV., containing Coleophora, Part 1. By H. T. STAINTON; assisted by Prof. ZELLER, J. W. DOUGLAS and Prof. FREY. London: Van Voorst, Paternoster Row. Demy 8vo., 282 pages letterpress. Eight coloured plates.

A most valuable volume, rivalling, if not surpassing, in beauty of illustration all its predecessors. The larvæ cannot fail to excite, in the mind of the thoughtful entomologist, reflections on the natural affinities of the Micro-Lepidoptera: we have here, reproduced on a diminished scale, the exact figures of these xylophagous larvæ which I first associated in 1832, and which constitute the most truly natural family in the entire class of Lepidoptera. Cossus, Zeuzera, Hepialus and Sesia are miniatured in Coleophora with the most marvellous precision. The price of the volume is 12*s.* 6*d.*

'*The Naturalist in Bermuda; a Sketch of the Geology, Zoology and Botany of that remarkable Group of Islands.*' By JOHN MATHEW JONES, Esq., of the Middle Temple. London: Reeves and Turner, 238, Strand. 1859. Post 8vo., 192 pages letterpress, with a Map and a few Woodcuts.

AN interesting and unpretending book, exhibiting a true love of Nature, and a total disregard of self. Little indeed was known of the Natural History of the Bermudas, and even now we wish to know more. The situation of the Bermudas, so well adapted as a resting-place for birds on their migratory tours, offers abundant opportunity for observation. In the list of birds observed by our author it is pleasing to meet with many whose names are so familiar at home. Mr. Jones is again about to return to England from these interesting islands, where, amidst other valuable knowledge acquired, it appears he has already done much towards unravelling the mystery of the sea serpent. I look forward with great interest to a second series, or at least a second edition, of the 'Naturalist in Bermuda.'

'*Young England: the Butterfly Number. A Natural History of all the British Butterflies.*' By EDWARD NEWMAN, F.L.S., Z.S. London: W. Kent and Co., 51 and 52, Paternoster Row. 1860. Price 6*d.*

I have no pecuniary interest in this literary venture; but as I heartily wish it success, I shall exhibit no false modesty about recommending it, although my portrait is so conspicuous on the title-page: I could indeed have wished this otherwise, but was overruled by the proprietor.

I have always held that a naturalist, that is a man who really believes in Natural History, must have two noble objects of ambition: *first*, making Natural History intelligible to every capacity; and, *secondly*, making it accessible to every pocket. It is in this spirit that this butterfly number has been conceived and carried out. The portraits of all our British butterflies have been admirably drawn by Mr. Willis, and equally well engraved by Mr. Kirchner. The descriptions are all written by myself, from the butterflies themselves, and there are no italics, abbreviations, or signs of any kind: in each description are a few words, used in a sense somewhat different from that assigned to them in our dictionaries: such words are explained and illustrated by a diagram; and every description has been kindly revised by Mr. Bond. I fear that a few readers of the 'Zoologist,' sticklers for the technical, will frown awfully on this first attempt to supply Natural History for the million; but to a large majority I confidently appeal to aid my efforts by introducing the Butterfly Number into every school in their neighbourhood, and into every family where there are boys and girls in want of occupation.

BOTANIST'S CORNER.

Woodsia alpina on the Breadalbane Mountains.—Last summer, when rambling among the Breadalbane mountains, in company with my father and Thomas Westcombe, I met with Woodsia alpina in abundance. We were fortunate enough to find a locality which, to all appearance, had never been examined by botanists before, and where the plant was growing with a luxuriance and profusion that realised one's ideas of what "ought to be somewhere." Imagine us revelling in the sight of tufts of this rarity bearing sixty-five, eighty, and even a hundred fronds each, some of these four inches long. I think I remember one spot where I could see seven tufts without moving a step. They are in many instances difficult of access, and some cannot be reached without extreme danger. One noble tuft of fifty strong fronds (apparently) can be easily seen, but even a daring and skilful cragsman would have to satisfy himself with this. We subsequently found fourteen plants of W. Ilvensis among the Dumfriesshire mountains, some of them fine and well developed. The Dumfriesshire plant is the true W. Ilvensis, and very different from the true W. alpina of the Breadalbane district. In cultivation, and even in a wild state, forms of W. Ilvensis may be found approximating W. alpina in appearance; but no one who has seen the dense erect tufts of the latter in a wild state can, I think, doubt the specific distinctness of the two. I believe Prof. Balfour's Woodsia hyperborea of the Clova mountains to be W. Ilvensis. I have seen W. Ilvensis frequently in the Clova district, but never a single plant of W. alpina; and a plant procured from thence, and marked W. hyperborea, in the Royal Botanic Gardens at Edinburgh, was W. Ilvensis.—*James Backhouse, jun.; York, January* 4, 1860.

[I think there is little doubt that the Woodsia hyperborea of Hooker, Balfour and other British authors is identical with W. Ilvensis, and I think Babington right in making but one species out of the specimens known to him; but the true Woodsia alpina, apparently unknown to all three writers, first figured by myself, 'British Ferns,' p. 79, and now found so abundantly by Mr. Backhouse and his friends, has strong claims to be regarded as a distinct species.—*Edward Newman.*]

Presence of a powerful Colouring Matter in Mercurialis perennis.—The property of the dog's mercury turning of a bluish or blackish green colour in drying, recorded by Messrs. Hooker and Arnott at p. 367 of their 'British Flora,' has doubtless come under the observation and perplexed many collectors of botanical specimens, but I cannot ascertain that it has ever been attributed to the presence of a powerful, and in many respects peculiar, colouring matter. Many plants lose their colour in drying, from the decomposition of the green pigment in its reaction with other products, as tannin, &c.; but the discoloration of the Mercurialis results from the production in the process of drying of an extremely soluble bright blue colour, not the slightest evidence of which occurs in the living plant, though of course, like many others, it pre-exists in the plant in a colourless state. Gradual drying appears most favourable to its development, as if the life of the plant is too suddenly destroyed by desiccation; at a high temperature little or none is produced. If the plant be allowed to gradually wither and lose its moisture in the open air, the presence of the colouring matter is made evident by the green parts turning of an inky colour, and the blanched part of the stem from underground of a rich metallic blue. The colour is most abundant in the early spring, when the plant is about six inches high, and gradually disappears as it attains its maturity in the autumn. The extreme solubility of the colour is easily manifested by placing a little bit of the dried plant in cold water, which in the course of a few minutes will be turned of a beautiful indigo-blue. When I first noticed it I rejoiced in the hope that I had discovered a new source of indigo, but soon found its properties in no way corresponded with that colour. Blue indigo is intensified in colour by sulphuric acid, and forms a straw-coloured compound with nitric acid. The blue pigment of the Mercurialis, as far as I have been able to ascertain, is turned red by all acids; indeed one of its principal characteristics is the extremely fugitive character of the tint as at first developed, and its tendency to change into a reddish purple. It differs from many vegetable colours, for example, litmus or red cabbage, in the red, produced from its blue form by acids, not being reconvertible into blue by an excess of alkali. A slight increase of temperature immediately converts the blue into a reddish purple tint, which appears to be the only permanent form of the colour. The blue colour also disappears on the solution standing for a few days, probably the result of incipient fermentation. In the dry state, as it exists in the plant, it appears to be more permanent, but I have not yet been able to dry from the solution the blue form of the colour. As a liquid, whether red or blue, it invariably evaporates to a rich reddish plum-coloured paste. I have been rather minute in the description of its characteristics, in the hope that some one may investigate the subject in a more practical form, and endeavour to utilize this product of one of our most abundant plants. I have little expectation that the blue form of the pigment can be made available by the dyer, but should think the permanent form, which is a fine rich colour, would make an excellent dye. According to Dr. Lindley many of the natural order to which the Mercurialis belongs have been made subject to the dyer's art.—*George Maw; Broseley, March*, 1860.

23 MA60

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